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James Phillips



A GENERAL  
SYSTEM OF NATURE,  
THROUGH THE  
THREE GRAND KINGDOMS  
OF  
ANIMALS, VEGETABLES, AND MINERALS,  
SYSTEMATICALLY DIVIDED  
INTO THEIR SEVERAL  
CLASSES, ORDERS, GENERA, SPECIES, AND VARIETIES,  
WITH THEIR  
HABITATIONS, MANNERS, ECONOMY, STRUCTURE,  
AND PECULIARITIES.

BY SIR CHARLES LINNÉ.

Translated from GMELIN, FABRICIUS, WILLDENOW, &c.

TOGETHER WITH

Various Modern Arrangements and Corrections, derived from the  
Transactions of the Linnean and other Societies, as well as from the Classical  
Works of Shaw, Thornton, Abbot, Donovan, Sowerby, Latham, Dillwyn,  
Lewin, Martyn, Andrews, Lambert, &c. &c.

WITH A LIFE OF LINNÉ,

Appropriate Copper-plates, and a Dictionary explanatory of the Terms which  
occur in the several Departments of Natural History,

BY WILLIAM TURTON, M. D.

Fellow of the Linnean Society, Author of the Medical Glossary, &c. &c.

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IN SEVEN VOLUMES.

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Mineral Kingdom.  
LIFE, DICTIONARY, &c.

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# MINERALS.

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**T**HAT all matter was primordially in a state of fluidity, and that the earth arose from the bosom of the waters, we have the testimony of Moses, Thales, and Seneca. And it is manifest, that the sea enveloping the chaotic nucleus, produced by slow and gradual means the continent, which by continually exhaling its dews into clouds, is regularly moistened by ætherial, rectified, deciduous showers. Genuine remains of the general deluge, as far as I have investigated, I have not found; much less the adamitic earth: but I have every where seen earths formed by the dereliction or deposition of waters, and in these the remains of a long and gradual lapse of ages.

The **WATER** of the ocean, frigid, passive, concipient, every where fecundated by a dry calescent active generating air, is observed teeming with a double offspring:

*A saline male, soluble, acrid, clear, crystalline,*

*A terrene female, fixed, viscid, opaque, attractorial.*

This water, moreover, affords nourishment to two other of its offspring, Animals and Vegetables, continued in their kind by a regular catenation of seeds, and these both are reduced into earth by a perennial circle of action.

**SALTS** are lapid, many-sided, diaphanous, soluble into infinite minute particles always retaining their original form, and concretizing again and again into larger masses of like uniform shape. These, by crystallization in and from various earths, generate various stones.

*Nitre*, which is aerial, and which by obduction augments sand.

*Muria*, which is marine, and which by corrosion attracts clay.

*Natrum*, which is animal, and which by refudation coagulates calx.

*Alum*, which is vegetable, and which by ramification cements soil.

These are the fathers of stones.

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**EARTHS** are reducible to dust, easily become dry, dissoluble, fixed, primitive; are generated by crystallization or formed by præcipitation, produced by acceſſence or reproduced by putreſcence. From theſe, by crystallization or attraction, ſtones are reproduced, which by the variation of the elements are repeatedly reſolved into earths, and again regenerated by a like perennial circle:

*Clay*, the precipitation of viſcid ſea-water,

Is opaque, plastic, friable, hardening in the air, and not fuſible by the action of fire.

*Sand*, the crystallization of turbid rain water,

Is hyaline, without moiſture, ſcintillant, of the ſame permanent hardneſs, and fuſible into glaſs.

*Soil*, the reſolution of acceſcent vegetables,

Is black, bibulous, reducible to duſt, inflammable, and combuſtible.

*Calx*, the reſolution of putreſcent animals,

Is whitish, abſorbent, farinaceous when dry, penetrable, and efferveſcing with acids.

**CLAY**, the earth of marine water, formerly oppoſed to muria, ſordid, viſcid, ſlippery to the touch, impalpable, without regular ſhape, tough, opaque, and becoming plastic by the addition of moiſture, in its native ſituation moiſt, becoming friable when dry, hardening by ignition, not fuſible by the greateſt degree of heat, but when mixed with other heterogeneous ſubſtances becoming variously ſhaped by fire; after remaining a long time dry, and compressed, is hardened into raſile *Talc*, which by reſolution is often regenerated into fibrous *Aſbeſtus*, but when minutely reſolved, is in a wonderful manner reproduced into ſcaly *Mica*.

**SAND**, the earth of rain-water, impregnated with ætherial nitre, ſhining, fixed, rigid, rough, crystalline, hyaline, not ſoftening in water, ſtriking fire with ſteel, of permanent hardneſs in ignition, but fuſible into glaſs by the greateſt degree of heat; caſt upon the continent and dried it forms the *Aranea mobilis*, which worn by age and become friable is the *Aranea Glarea*; each becoming moiſt under ground, obliquely and tranſverſely cleft, and ultimately uniting and forming *Sand-ſtone* by minute atoms of crystallization, or mixed with humid extraneous ſubſtances is cemented into *Gravel*, and this again into various ſtones, ſtones into rocks, but when reſolved and recrystallized it forms *Quartz*.

**SOIL**, the earth of vegetables, eagerly combining with nitre, acceſcent, of a black colour, greedily imbibing moiſture, crumbling into powder in fracture, reducible to duſt when dry, flaming in ignition, combuſtible in a greater degree of heat, by continued compression is indurated into fiſſile ſchiſt, which when ſaturated with

bitumen becomes *Coal*. *Schist* is however often resolved into earthy *Ochre*, which by multiplied mineralization is regenerated into *Toph*.

**CALX**, the earth of animals, combined with *Natrum*, alkaline, of a whitish colour, absorbing acids, easily scraped with a knife, farinaceous when dry, penetrable by fire, effervescing when burnt, calcifying moist and argillaceous extraneous substances into *Marble*; but when resolved and saturated with acid is recrystallized into *Gypsum*, not again effervescing with acid without depuration by fire, and each is resolved by the elements into farinous *Chalk*, concreting by æthereal water into *Flint*, but when resolved is recrystallized into *Spar*.

These are the mothers of stones.

**STONES** grow from earths, are again resolved, and again reproduced.

*Clay* is attracted into *Talc*, resolved into *Lithomarg*, and regenerated into *Amiant*.

*Sand* accretes together into *Free-stone*, is resolved into *Gravel*, and regenerated into *Rock*.

*Soil* is cemented into *Schist*, resolved into *Ochre*, and regenerated into *Toph*.

*Calx* is coagulated into *Marble*, resolved into *Chalk*, and regenerated into *Alabaster*.

Diaphanous stones have their origin from a fluid mother, opaque stones from a fixed one. They are often tinged with a vitriolic alumen, varying in colour according to their various tinctures, and by these are filled and consolidated with a cicatrix the fissures of rocks.

*Mica*, the concretion of clay, is scaly, flexible, opaque, shining, becoming more rigid in ignition and at the same time more shining.

*Quartz*, the crystallization of elementary water, is pellucid, hard, from the watery cavities of rocks, and therefore always parasitic, its crystals being often obscured by abrasion or by its bulk.

*Spar*, the crystallization of calcareous water, is diaphanous, fragile, whose internal rhombs an adept will easily distinguish from a different crystal; adulterated with iron it becomes harder and strikes fire with steel.

**CRYSTALS** are stony, produced in and from water impregnated but not saturated with salt, which abounds with impalpable terrestrial atoms and is retained in the cavities of stones. They increase by long and undisturbed habitation, and are not again soluble by water into impalpable atoms. In their many-sided figure they differ from all other stones, nor have they any other however common to most salts, which is the sole cause of crystallization at present known, nor would salts have a determinate figure unless by

similar incorporation. Stalactite accretes with a crystalline covering, in like manner as calculus; and no one will venture to suppose that crystals can exist without salt, or deny that the earth is crystallized by salts. Their transparency is derived from their atomical construction, and their colour from metals. The value of gems is according to their transparency, hardness, permanency and colour; and from their being the principal instruments of human luxury, are often imitated by the frauds of trade.

**VITRIOL**, the product of alum, intimately allied to metal, is of different appearance and figure according to the nature of the metal, of which the most frequent are Iron, Copper, and Zinc; some therefore most commonly become sulphureous Pyrites, others terrene Ochres. Different Pyrites assume different figures, whose earth into which it is resolved is usually denominated Ochre, which when proceeding from Iron is yellow, and becomes red when burnt; when from Copper by acid is green, by alkali blue: so that stones which are yellow or red, are principally from Iron; those which are green or blue, from Copper. Each kind of Ochre, by crystallization, coagulates earths into *Tophi*.

**METALS** are supradecomposed, and consist of Earth, Salt, and Sulphur. Iron, whenever present, is often dissolved by the elements; and when dissolved by vitriolic salt and an ochraceous earth precipitated, Iron by crystallization cements earths into stones, and absorbed is multiplied by metal, and so produces many times more than it had primarily received. Vitriol stagnating in the fissures of rocks retaining water, when multiplied and precipitated by a long lapse of time, passes into a vein, which when opened transversely and filled up with a different earth, will forthwith change the metallic vein into a different one; as from Iron or Copper, Lead often becomes enriched with Silver, &c. For the same vein, by variable modification, may abound in Alum, Vitriol, Arsenic, Sulphur, Iron, Copper, Gold, Silver, Antimony, Lead, Zinc, or Bismuth.

**ROCKS**, appearing like the prominent bones of the earth, are of great bulk, solidity, and longevity; composed of sand, gravel, opaque and diaphanous stones, with every where argillaceous and often talcose substances intermixed; and are at length cemented into more solid masses, with a various and irregular mixture of crystals of Quartz, Mica, and Spar. That these are the off-spring of time and the strata of nature, no one will doubt, whose constituent parts are to every one palpable. In these the metallurgist will discover the matrices of minerals, many-shaped from their mixture, and diversified in fire.

**PETRIFACTIONS** are rather the parents than the product of marmoreous mountains, and may consist of as many diversifications



as there are species of animals and vegetables. The intelligent investigator will not therefore straiten the limits of an useful science, by disregarding the ancient inhabitants of the globe, though unknown to modern naturalists. The modes of petrification are principally fourfold; Fossils, substances restored, substances impressed, and substances transubstantiated; and are more frequent in Marble, Flint, Schist, Sand-stone, Rock, and Quartz.

THE difficulties of science have moreover produced various paradoxes.

Consolidated fissures of rocks are often distinctly visible; but by what means or power they have been broken, is not easily demonstrated.

All Spar is generated by crystallization, in cavities filled up, nor is spate ever present without rhombs; but why it is broken into rhombs, or how from a cubico-muriatic is produced a rhombic figure, is not very evident.

Amiant is observed to be regenerated from the earth of Talc, the cause of which is obscure.

That Molybdænum is metallic cannot be doubted, and it has often been asserted to be impregnated with Zinc or Tin; yet it is not easy of proof. Jews-stones are found petrified in hollow cavities, generated from a fluid with spar, of which they often entirely consist: but from what animal they have their origin is not sufficiently evident, since the echini do not afford a satisfactory elucidation.

PRIMARY Salts have a peculiar and determinate figure, but when changed, often appear with a different but alike determinate figure; but from what mixture proper to themselves, or from what extraneous terrene mixture, the student in this department has not been able to determine; and since metals are generated from salt by crystallization, Alchemists have in vain laboured at the true transformation of metals; and this metamorphosis of salts shall remain undiscovered, so long as Metallurgists shall neglect it, and turn their investigations towards earths only.

SIMILAR Strata\* of the earth are often observable in broken mountains; but it is not evident that they are all of the same genus, or produced from the waters of the ocean:

1. The lowermost stratum of *Sand-stone*.
2. The second of *Schist*.

.....

\* The various strata of earth are constantly observed in equal order and distance; and therefore this accretion of soil, so well kept distinct, should be rather considered as the operation of a succession of ages, than the tumultuous jumble of the general deluge. *Ramazz. mut.* 279.

3. The third of *Marble*; with marine petrifications imbedded, and often extraneous matter.
4. The fourth of *Schist*.
5. The fifth and uppermost of *Rock*, often of vast bulk.

IT is palpable to common observation, that the ocean is the mother of the earth.

- a. The waters of ocean, made turbid by nitrous showers, are precipitated and crystallized into sand which covers the bottom of the sea.
- b. The ocean is here and there in vast patches, overspread with the *Fucus natans*; causing tranquility on its surface, unless when agitated by variable winds.
- c. The soil from decayed Fuci b) gradually descends, being lighter than sand a), while this marine vegetable gradually dilates itself into a floating meadow.
- d. Marine Worms, Molluscæ, Testaceous Animals, Lithophytes and Zoophytes, Fishes with their floating eggs, and Sea-birds, whose formation renders them unfit for flight, feed under this marine meadow of *Fucus* c).
- e. Under the waters in a state of tranquility b), is showered down an argillaceous sediment with the calcareous shells d) of gradually corrupting worms, till an elevated accumulation is formed parallel with the surface of the sea, while its pressure moving the waters b), repels the marine substances around it d).
- f. For the formation of *Rock*, according to its own laws, the sea first casts up vast masses of Fuci, which moulder into soil, clothing the naked earth at the bottom with an arenaceous covering, at first easily blown about when dry, and when mixed concreting into gravel and ultimately into rocks.
- g. By a long succession of ages therefore, and by a perennial quiescence of seasons,
  1. *Sand* a) is concreted into *Sand-stone* 1), variously but properly cleft.
  2. *Soil* c) is cemented into *Schist* 2), lamellous and combustible.
  3. *Clay* e) is indurated into *Marble* 3) conglutated by worms.
  4. *Soil* f) is cemented into an upper stratum of *Schist* 4), lamellous and combustible like the former.
  5. *Sand* f) is concreted into *Gravel* 5), with a mixture of other substances.
6. This again is concreted into smaller stones, these into larger, and these last into rocks; till at length, the waters of the sea gradually subsiding, there appears a mountain: nor can the highest rocks float upon an argillaceous surface, while, before it became calcified, marine worms continue their growth in it. That the highest rocks therefore are the genuine offspring of time, while all was silence, themselves sufficiently declare. "Such are the mutations produced by the lapse of time."†

† *Luc. xii. 40.*

IT is very rarely, and indeed scarcely ever, that the *Species* can be sufficiently determined, since in these the generation proceeds not from the egg; but the multiplied variety of irregularly sportive nature, is at once the calamity of the science and the foundation of metallurgy. He therefore that shall rashly endeavour to multiply the species, is not less absurd than him who combines substances totally different in nature. Nor does their matrix distinguish the different species, more than their natural situation and soil do the plants of the earth. The numerous diversities of stones, therefore, are principally varieties; in the arrangement of which, without caution, it is easy to fall into error.

THE student has three modes of investigating this Kingdom: *Physical*, which descends through the obscure generation of minerals: *Natural*, which considers their superficial and visible structure: *Chemical*, which ascends through their destructive analysis. In this then, as in every thing else, he will most safely follow the middle course, and by closely following his ariadnean thread, he will not, like an empiric, confound the symptoms with the cure, nor bring forward the doubtful progeny of a long lost ancestry; much less will his terrified imagination raise up fanciful spectres in the dark, or persuade him that the Phoenix of the poets may be regenerated from its own ashes: but he will learn, what names are repugnant to things, and what are convenient; and how to define characters by their diagnostics, and not merely by their etymology. But here let me pause, lest in endeavouring to remove obscurity, I myself become obscure.



THE FOLLOWING  
ARE THE PRINCIPAL  
SYSTEMS  
OF  
MINERALS.



BROMEL. *Stockholm. 1730. octav.*

## I. EARTHS.

Bole.  
 Lac lunæ.  
 Lithomarg.  
 Umbre.  
 Veronfe earth.  
 Mountain green.  
 Fuller's earth.  
 Cologn earth.  
 Ochre.  
 Chalk.  
 Tripoli.  
 Porcellane.  
 Marl.  
 Gur.  
 Turf.

## II. SALTS.

Culinary salt.  
 Nitre.  
 Alum.  
 Vitriol.

## III. SULPHURS.

Sulphur.  
 Bitumen.  
 Petroleum.  
 Amber.  
 Coal.

## IV. STONES.

1. *Resisting the action  
 of fire.*  
 Pot-stone.  
 Amiant.  
 Asbestos.  
 Fusorii.

V. 2. *Calcinable.*

Calcareous.  
 Swine-stone.  
 Marble.  
 Alabaster.  
 Spar.  
 Stalactite.  
 Schist.  
 Cat's eye.

VI. 3. *Vitrifying in fire.*

Sand.  
 Sand-stone.  
 Gem.  
 Granate.  
 Flint.  
 Quartz.  
 Crystal.  
 Fluor.

## VII. FIGURED.

Lusus.  
 Geographic.  
 Eagle-stone.  
 Osteocolla.  
 Thunder stone.  
 Violet-stone.

VIII. PETRIFAC-  
TIONS.

Woods.  
 Plants.  
 Corals.  
 Insects.  
 Fish.  
 Crustaceous.  
 Testaceous.  
 Animals.

## IX. CALCULI.

Bezoar.  
 Crab's eyes.  
 Margarite.

## X. SEMIMETALS.

Mercury.  
 Antimony.  
 Bismuth.  
 Zinc.  
 Plumbago.  
 Calamine.  
 Magnesia.  
 Blood-stone.  
 Magnet.  
 Emery.  
 Mountain blue.  
 Arsenic.  
 Orpiment.  
 Cobalt.  
 Pyrites.  
 Basalt.  
 Steril black.

## XI. METALS.

Gold.  
 Silver.  
 Copper.  
 Tin.  
 Lead.  
 Iron.

BROMEL has given no generic character.

The Lapis violaceus, (so denominated from the Bissus Jolithus which grows upon it) he has considered as a proper species.

He separates Sand from Earths.

Sulphur, order 3, he distinguishes from Pyrites, order 10.

Serpentine, by himself and some others is referred to the Marbles.

Mica he thinks fit to join with calcareous stones.

He divides simple stones, into those which remain unaltered by the action of fire, those which vitrify by the action of fire, and those which by the action of fire are reduced to calx. This division is sometimes followed by others; by Linné in the orders 3, 2, 1. by Wolterstorff in the orders 2, 4, 1. by Wallerius in the orders 3, 2, 1. by Anonymus in the orders 4, 2, 1. and by Vogel in the orders 1, 5, 2.

The Bromelian method can hardly be called a system, in as much as he has omitted the classification, generic character, specific differences, and the synonyms of Authors.

The SYSTEM of LINNE. *Leyden.* 1736. 1748.

I. STONES. II. MINERALS, III. FOSSILS.

I. VITRESCENT.

Sand-stone.  
Quartz.  
Silex.

2. CALCAREOUS.

Marble.  
Spar.  
Schist.

3. APYROUS.

Mica.  
Talc.  
Amiant.  
Asbestos.

I. SALTS.

Natrum.  
Selenite.  
Nitre.  
Muria.  
Alum.  
Vitriol.

2. SULPHURS.

Amber.  
Bitumen.  
Pyrites.  
Arsenic.

3. MERCURIALS.

Quicksilver.  
Antimony.  
Zinc.  
Bismuth.  
Iron.  
Tin.  
Lead.  
Copper.  
Silver.  
Gold.

I. CONCRETE.

Rock.  
Toph.  
Stalactite.  
Pumice-stone.  
Eagle-stone.  
Tartar.  
Calculus.

2. PETRIFACTIONS.

From Worms.  
Insects.  
Fish.  
Birds.  
Quadrupeds.  
Plants.  
Impressions  
of other  
substances.

3. EARTHS.

Marle.  
Ochre.  
Chalk.  
Clay.  
Sand.  
Soil.

THE laws of generation persuade us to commence our classification in earths, but the laws of system are repugnant.

For earths by general consent, constitute a natural order, and should not therefore be divided into different classes.

Congeneric species, should likewise be separated from others of a like genus: for some clays resist the greatest degrees of heat, others are calcareous.

Ochres also should precede Metals, before the idea of Metals is given, whose progeny they nevertheless are: yet some Ochres must be referred to Copper, some to Iron, Bismuth, &c.

Some species of earths are primitive and should precede rocks; others are derivative and should be placed after them.

If Fossils be divided among Stones or Minerals, then Tophs and Stalactites would be separated from their natural genus and distributed among different ones.

Many petrifications would be placed among calcareous rocks, some among combustibles, others among Pyrites, Copper, Bitumen, &c.

CRYSTALS I would have placed among the Salts; but to prevent a mere dispute about words, he that thinks fit may easily substitute the term Crystal in the room of Salt. For is it not the same thing to say that Salts have determined their figure under the generation of Salts, or that they are the constitutive elements of Salts?



The SYSTEM of LINNE. *Stockholm. 1768.*

## I. ROCKS.

## I. HUMOSE.

1. Schist.

## II. CALCAREOUS.

2. Marble.

3. Alabaster.

4. Sturium.

5. Spar.

## III. ARGILLACEOUS.

6. Talc.

7. Amiant.

8. Mica.

## IV. ARENATE.

9. Sand stone.

10. Quartz.

11. Silex.

## V. AGGREGATE.

12. Stone.

## II. MINERALS.

## I. SALTS.

13. Nitre.

14. Natrum.

15. Borax.

16. Muria.

17. Alumen.

18. Vitriol.

## II. SULPHURS.

19. Ambergis.

20. Amber.

21. Bitumen.

22. Pyrites.

23. Arsenic.

## III. METALS.

24. Quicksilver.

25. Molybdænum.

26. Antimony.

27. Zinc.

28. Bismuth.

29. Cobalt.

30. Tin.

31. Lead.

32. Iron.

33. Copper.

34. Silver.

35. Gold.

## III. FOSSILS.

## I. PETRIFACTIONS.

36. Zoolite.

37. Ornitholite.

38. Amphibiolite.

39. Ichthyolite.

40. Entomolite.

41. Helmintholite.

42. Phytolite.

43. Grapholite.

## II. CONCRETE.

44. Calculus.

45. Tartar.

46. Eagle-stone.

47. Pumice-stone.

48. Stalactite.

49. Toph.

## III. EARTHS.

50. Ochre.

51. Sand.

52. Clay.

53. Calx.

54. Soil.

I. ROCKS are steril stones, produced by cohesion from a terrene origin.

*Simple*, without extraneous mixture (of Salt, Sulphur or Mercury).

*Fixed*, not totally soluble in any menstruum.

*Similar*, of particles confusedly mixed together.

1. HUMOSE, from the earthy deposition of Vegetables.

*Combustible*, burning into ashes.

In its minute particles branny, coarser and lighter.

2. CALCAREOUS, from animal earth.

*Penetrable*, and becoming more porous by fire.

In its minute particles farinaceous, when burnt falling into farinaceous particles.

3. ARGILLACEOUS, from a viscid marine sediment.

*Hardening*, and becoming harder and more rigid by fire.

In its minute particles lubricous before being burnt.

4. ARENATE, from the precipitation of ætherial showers.

*Scintillating*, when struck with steel, and very hard.

In its minute particles rough, and angular like particles of broken glass.

5. AGGREGATE, and composed of the 4 preceding substances.

*Participating* of the constituent particles of the former ones.

In its minutest particles varying according to the nature of the materials (1—4) which compose it.

II. MINERALS are fruitful stones, produced by crystallization from a saline origin.

*Compound*, from rock impregnated with extraneous substances, (Salt, Sulphur, and Mercury).

*Soluble* entirely in their proper menstruum, (some calces are dissoluble into earth, but not totally soluble).

*Crystalline*, certainly produced by crystallization, (before they have been burnt).

1. SALTS are distinguished by the sense of taste.

*Sapid* in water.

*Soluble* in water.

2. SULPHURS are distinguished by the sense of smell.

*Odorous* in inflammation and ignition.

*Soluble* in oil.

3. METALS are known by the sense of sight.

*Splendid*, fusile in fire, very ponderous.

*Soluble* in their appropriate acid menstua.

III. FOSSILS are neutral stones, and are produced from either one or both of the former.

They are *modified* from Rocks or Minerals.

1. PERTIFACTIONS.

*Impressed* with the figure of some natural object.

2. CONCRETE.

*Coagulated*, with particles promiscuously agglutinated.

3. EARTHS.

*Pulverized*, with the particles not united,

## CLASS I. ROCKS.

### I. HUMOSE.

1. SCHIST, fissile.

### II. CALCAREOUS.

2. MARBLE, of no determinate shape, effervescing.
3. GYPSUM, of no determinate shape, fixed.
4. STIRIUM, fibrous.
5. SPAR, rhombic.

### III. AGILLACEOUS.

6. TALC, solid.
7. AMIANT, fibrous.
8. MICA, scaly.

### IV. ARENATE.

9. SAND-STONE, of granular fragments.
10. QUARTZ, of angular fragments.
11. SILEX, of convex fragments.

### V. AGGREGATE.

12. ROCK, of mixed heterogeneous particles.

**ROCKS** are from their nature sought for in their mother Earth.

The *Mothers* of Earths are principally four :

*Soil*, muddy, vegetable, combustible.

*Calx*, testaceous, animal, effervescing.

*Clay*, apyrous, aquatile, hardening.

*Sand*, moveable, aquatile, hardened.

- I. **HUMOSE**, from vegetable earth, flaming and combustible when burnt.

*Soil* is the slow deposition of waters, and is therefore horizontally fissile.

*Argillaceous* particles are often deposited with soil, by which Schist becomes more or less argillous.

*Mineral acid* from marshes sometimes gives it a tinge of Iron, And when burnt they produce a red ochraceous earth.

*In burning* they are consumed, unless when mixed too much with metal.

- II. **CALCAREOUS**, from testaceous substances or *Lythophytes* changed into earths.

For all calx is produced from the animal kingdom.

*Effervescent* and soluble in acids, and therefore are alkaline, unless they have been previously saturated with acid, as Gypsum.

*Burnt* and extinguished by water they fall into a branny powder.

By the power of *calcination* or *petrification* they become multiplicative, in humose, vegetable, animal, and probably calcareous substances.

- III. **ARGILLACEOUS**, from a viscid marine matter coagulated into earth.

*Rafle* & lubricous when reduced, since they are of a soft viscid origin.

*Hardening*, they become dryer and harder by the action of fire.

They were formerly denominated apyrous.

- IV. **ARENATE**, from atoms of water united into an arenaceous substance.

They have their origin from ætherial rain water.

*Particles*, hard, rough, leaving a mark.

Striking fire with steel from their solidity and hardness.

They were formerly denominated vitrescent.

- V. **AGGREGATE**, from mixed particles of the preceding orders.

*Hardening*, from whatever earth, porous.

Their hollow interstices were filled up with terrestrial water, which becoming solid particles added a mixture of Quartz, Spar, Mica.

*In ignition* they are to be considered according to the qualities of which they are composed.

## CLASS II. MINERALS.

## I. SALTS.

- 13. NITRE: frigido-acid, essential.
- 14. NATRUM: bitterish, alkaliescent.
- 15. BORAX: slightly lapid, alkaliescent.
- 16. MURIA: acute, intermediate.
- 17. ALUM: austere, a mineral acid.
- 18. VITRIOL: styptic, a mineral acid.

## II. SULPHURS.

A. *Unctuous, inert.*

- 19. AMBERGRIS: emitting ambrosiacal fumes.
- 20. AMBER: emitting suaveolent fumes.
- 21. BITUMEN: emitting grave fumes.

B. *Mineralized, metallic.*

- 22. PYRITES: emitting acute yellowish fumes.
- 23. ARSENIC: emitting alliaceous white fumes.

## III. METALS.

A. *Friable, semimetals.*

- 24. QUICKSILVER: fluid, dry.
- 25. MOLYBDÆNUM: marking, not fusile.
- 26. ANTIMONY: fibrous, friable.
- 27. ZINC: rimose and malleable.
- 28. BISMUTH: laminous and malleable.
- 29. COBALT: compact, fragile.

B. *Malleable, perfect metals.*

- 30. TIN: quite white, mute.
- 31. LEAD: blueish, mute.
- 32. IRON: brownish, sonorous.
- 33. COPPER: rufous, sonorous.
- 34. SILVER: quite white, sonorous.
- 35. GOLD: yellow, mute.

ALL Minerals are produced by crystallization, except the unctuous Sulphurs.

The extraneous matters commonly contained in Minerals, are Salt, Sulphur, Mercury.

*Minerals* are to be distinguished by separating from them their extraneous connections, and then reducing them to their genera and appropriate characters; for, as in plants, they are to be found in their internal fructification.

SALTS dissolved in water, are crystallized by a diminution of the vehicle, by quiescence, and cold

They are *many-sided*, and their crystals show that all Salts are from plane and right angles.

The figure of *Crystals* in the same Genus are often in some measure changed, but not without the intentions of nature, who never acts without sufficient cause, in whose agency nothing is superfluous, nothing deficient; this the knowledge of future ages will disclose, and the numerous observations wandering through the dark recesses of nature will at length find out her ways.

*Stony Crystals* I have retained according to their figure, as far as investigations have hitherto extended.

That *Earth* can be crystallized without salt by the humid way, I will give credit to when I shall have seen it; the dry way is totally distinct.

SULPHURS in ignition give out flame and smoke, are dissolved in oil, for they abound in salt, and are decomposed.

The *unctuous* agree in many respects with the reins of vegetables, and are probably of vegetable origin.

The *mineralized* have a saline metallic combination.

METALS give a shining opaque regulus, fluid in ignition; except Molybdænum which is as yet obscure.

The *transmutation* of Metals, hitherto concealed in the temple of Vulcan, is to be regarded as one of the secrets of nature; and from very few parents are produced a numerous offspring. Mars was altogether polygamous.

*Plantina* in specific gravity is from 20 to 22,000. its fusion is 9. amalgamation 0. colour white, and is soluble only by oxymuriatic acid.

*Gold* is in specific gravity 19,640. its fusion is 6. amalgamation 1. colour yellow, in consistence most malleable and ductile, is without sound or mute, and is soluble by the oxymuriatic acid.

*Silver* is in specific gravity 11,091. in fusion 5. in amalgamation 2. in colour white, in consistence most malleable and ductile, is sonorous, and is soluble by the nitrous acid.

*Copper* is in specific gravity 8,843. in fusion 7. in amalgamation 7. in colour rufous, in consistence malleable, is sonorous, and soluble by the nitrous acid.

*Iron* is in specific gravity 8,000. fusion 8. amalgamation 8. colour brown, consistence malleable, is sonorous, and soluble by the nitrous acid.

*Lead* is in specific gravity 11,325. fusion 4. amalgamation 3. colour blueish-white, consistence soft, is mute, and soluble by the nitrous acid.

*Tin* is in specific gravity 7,400. fusion 3. amalgamation 4. colour white, consistence crackling when bent, is mute, and soluble by the oxymuriatic and nitrous acids.

*Cobalt* is in colour white, consistence fragile, and soluble in the oxymuriatic and nitrous acids.

*Bismuth* in in specific gravity 9,700. amalgamation 6. colour yellowish-white, consistence laminois-malleable, is sonorous, and soluble by the nitrous acid.

*Zinc* is in specific gravity 7,000. fusion 2. amalgamation 5. colour white, consistence rimoso-malleable, somewhat sonorous, and soluble by the nitrous acid.

*Antimony* is in fusion 6. amalgamation 9. colour white, consistence very fragile, soluble by the nitrous acid.

*Quicksilver* is in specific gravity 13,590. fusion 1. colour white, consistence fluid, is mute, and soluble by the nitrous acid.

#### The quality of

*Iron* is blackish, austere, styptic.

*Copper*, green or blue, corrosive.

*Zinc*, white, drying

*Lead*, whitish, dulcifying.

*Antimony*, rapacious, except Gold the wolf of metal.

*Quicksilver*, penetrating, salivating, amalgamating, servile and fugitive.



## CLASS III. FOSSILS.

## I. PETRIFICATIONS.

- 36. ZOOLITH: petrified Mammalia.
- 37. ORNITHOLITH: petrified Birds.
- 38. AMPHIBIOLITH: petrified Amphibia.
- 39. ICHTHYOLITH: petrified Fishes.
- 40. ENTOMOLITH: petrified Insects.
- 41. HELMINTHOLITH: petrified Worms.
- 42. PHYTOLITH: petrified Vegetables.
- 43. GRAPHOLITH: petrified resemblances of other substances.

## II. CONCRETE.

*A. Natural.*

- 44. CALCULUS: concrete within animal matter.
- 45. TARTAR: concrete within vegetable matter.
- 46. EAGLE-STONE: concrete within stones.

*B. Elementary.*

- 47. PUMICE-STONE: concrete in fire.
- 48. STLACTITE: concrete in air.
- 49. TOPH: concrete in water.

## III. EARTHS.

*A. Derivative.*

- 50. OCHRE: metallic earth.

*B. Primitive.*

- 51. SAND: rough earth.
- 52. CLAY: plastic earth.
- 53. CALX: effervescent earth.
- 54. SOIL: combustible earth.

1. PETRIFICATIONS are the parents, and not the offspring of calcareous mountains; since all calx originates from animals.

The bodies subject to petrification are solid, as shells, bones, and woods.

Succulent bodies deliquesce and corrupt, before stony bodies can harden.

They occur in every part of the globe wherever calx is found; and are found in the highest mountains of Peru.

The materials producing petrification are various.

Calx by its calcifying power changes other bodies into a calcareous substance; *e. gr.* Schist into Marble; *It. Wgoth.* Silix is connate with Calx, and in like manner exhibits petrifications.

Vitriols by ferrumination conglutinate and penetrate: the Tophus marinus and some others frequently contain shells.

Schist from soil or sand often presents the vestiges of impressed substances before its coalescence.

Amber is not with propriety brought under this head, since it merely contains and preserves from corruption, bodies formerly inclosed within its resin.

The modes of petrification are,

By transubstantiation, where the whole material is preserved in its original form.

By redintegration, where the original substance is worn away by age, and the cavity filled up by a lapidescent material which preserves its ancient form: Hysterolith.

By impression, where the petrifying body receives and retains the figure of substances impressed upon it.

By incrustation, after the manner of Stalactite, from calcareous water, particularly that of warm springs: but these will hardly come under the denomination of petrifications, since the same things may be effected at pleasure by art or the injection of bodies.

Fossils, generally so called, are shells or bones deprived of their gluten by age: testaceous substances, lithophytes, woods.

The specific name, wherever it is ascertained, should be taken from the animal or plant; that he who discerns the lapideous prototype may be able to know its animal or vegetable ectype, to observe what is distinct, to remove doubts, and to reject superfluities. It will likewise be useful to exhibit and consider lithophytes and testaceous substances whose prototypes are unknown, and which may illustrate the cognisance of nature or the generation of the earth.

II. IN CONCRETES are determined coagulated substances, as ochraceous, marmoreous, gypseous, striate, spatose, argillaceous, &c.

III. EARTHS are pulverulent and the mothers of stones, a very few their offspring.

Primitive are those which are referred to this kingdom from the elements, animals or vegetables.

Derivative are those which have their origin in pulverised stones.

The SYSTEM of WALLER. *Stockholm. 1747.*

## I. EARTHS.

1. *Dry.*  
Soil.  
Chalk.
2. *Greasy.*  
Clay.  
Marl.
3. *Minerals.*  
Saline.  
Sulphureous.  
Metallic.
4. *Arenaceous.*  
Sand.  
Gravel.  
Metallic.  
Animal.

## II. STONES.

1. *Calcareous.*  
Lime-stone.  
Marble.  
Gypsum.  
Spar.
2. *Vitreſcent.*  
Fiſſile.  
Sand-stone.  
Flint.  
Petroſilex.  
Quartz.  
Cryſtal.

3. *Apyrous.*  
Mica.  
Talc.  
Pot-ſtone.  
Hern-ſtone.  
Amiant.  
Aſbeſtus.
4. *Rocks.*  
Simple.  
Mixed.  
Grey.  
Petroſe.

## III. MINERALS.

1. *Salts.*  
Vitriol.  
Alum.  
Nitre.  
Muria.  
Alcalies.  
Acids.  
Neuters.  
Ammoniac.  
Borax.
2. *Sulphurs.*  
Bitumen.  
Amber.  
Ambergris.  
Sulphur.

3. *Semimetals.*  
Quickſilver.  
Arſenic.  
Cobalt.  
Antimony.  
Biſmuth.  
Zinc.
4. *Metals.*  
Iron.  
Copper.  
Lead.  
Tin.  
Silver.  
Gold.

## IV. CONCRETE.

1. *Pores.*  
Igneus.  
Aquous.
2. *Petrified.*  
Vegetables.  
Corals.  
Animals.  
Teſtaceous.
3. *Figured.*  
Lithomorphi.  
Lithoglyphi.  
Lithotomi.
4. *Calculi.*  
Of vegetables.  
— animals.

He firſt determined rightly the ſpecies in this kingdom.

He reſolved in a beautiful manner the analyſis of ſtones.

He who underſtands the ſulphureous exhalations of mountains, and comprehends the matrices of metals, will not want a key to the generation of metals, 224.

Terreſtrial mephitis he conſiders the father of ſalts, 181.

He admits that primeval ſtones ſometimes occur among others, viz. Jaſper, 101. Species of Quartz, 106. Mica, 132.

The SYSTEM of WALLER. *Stockholm. 1772.*

## I. EARTHS.

1. *Dry.*  
Soil.  
Calcareous.  
Gypseous.  
Molybdænum.
2. *Tenaceous.*  
Clay.  
Marl.
3. *Mineralized.*
4. *Hard.*  
Gravel.  
Tripoli.  
Cement.  
Sand.  
Metallic sand.  
Animal sand.

3. *Fusible.*  
Zeolith.  
Basalt.  
Magnesia.  
Schist.  
Margodes.  
Horn-stone.
4. *Apyrous.*  
Mica.  
Talc.  
Soap-stone.  
Serpentine.  
Pot-stone.  
Asbestus.  
Amiant.
5. *Rocks.*  
Mixed.  
Aggregate.

3. *Semimetals.*  
Mercury.  
Arsenic.  
Cobalt.  
Nickel.  
Antimony.  
Bismuth.  
Zinc.
4. *Metals.*  
Iron.  
Copper.  
Lead.  
Tin.  
Silver.  
Gold.  
Platina.

## II. STONES.

1. *Calcareous.*  
Lime-stone.  
Marble.  
Spar.  
Gypsum.  
Mineral fluor.
2. *Vitrescent.*  
Sand-stone.  
Scintillating spar.  
Quartz.  
Gem.  
Granate.  
Silex.  
Petrofalex.  
Agat.  
Jasper.

## III. MINERALS.

1. *Salts.*  
Acids.  
Vitriol.  
Alum.  
Nitre.  
Rock-salt.  
Natron.  
Volatile alkali.  
Neuters.  
Ammoniac.  
Borax.
2. *Sulphurs.*  
Bitumen.  
Amber.  
Ambergris.  
Sulphur.

## IV. CONCRETE.

1. *Pores.*  
Igneous.  
Aqueous.
2. *Petrifications.*  
Vegetables.  
Corals.  
Helmintholith.  
—— of shells.  
Entomolith.  
Amphibiolith.  
Ichyolith.  
Ornitholith.  
Anthropolith.
3. *Figured.*  
Lithomorph.  
Lithoglyph.  
Lithotomi.
4. *Calculi.*  
Vegetable.  
Animal.

The SYSTEM of WOLTERS DORF. *Berlin.* 1748.

## I. EARTHS.

1. *Argillous.*  
Clay.  
Soil.
2. *Alcaline.*  
Chalk.  
Marl.

## II. STONES.

1. *Vitrescent.*  
Gem.  
Crystal.  
Quartz.  
Sand-stone.  
Horn-stone.  
Vitrescent spar.  
Rock.  
Pumice-stone.
2. *Argillous.*  
Smectis.  
Asbestus.  
Talc.  
Mica.  
Schist.
3. *Gypseous.*  
Gypsum.  
Alabaster.  
Gypseous spar.
4. *Alcalines.*  
Lime-stone.  
Marble.  
Alcaline spar.  
Toph.  
Stalactite.  
Margode.

## III. SALTS.

1. *Acids.*  
Pure acid.  
Vitriol.  
Alum.
2. *Alcalines.*  
Fixed.  
Volatile.
3. *Intermediate.*  
Natrurn.  
Nitre.  
Common salt.

## IV. BITUMENS.

1. *Fluid.*  
Mountain oil.
2. *Solid.*  
Ambergris.  
Amber.  
Mountain pitch.  
Sulphur.

## V SEMIMETALS.

1. *Fluid.*  
Quicksilver.
2. *Solid.*  
Antimony.  
Zinc.  
Bismuth.  
Arsenic.

## VI. METALS.

1. *Noble.*  
Gold.  
Silver.

2. *Ignoble.*

Copper.  
Iron.  
Tin.  
Lead.

VII. PETRIFAC-  
TIONS.

1. *Of sanguineous animals.*  
Zoolith.  
Ornitholith.  
Ichthyolith.
2. *Of insects.*  
Entomolith.  
Gammarolith.  
Echinites.  
Encrini.  
Caput Medusæ.
3. *Of testaceous animals.*  
Tubulites.  
Cochlites.  
Conchites.
4. *Vegetables.*  
Stelechites.  
Lithoxylum.  
Lithobiblion.  
Carpolith.  
Phytolith.
5. *Of marine substances.*  
Corallite.  
Porite.  
Fungite.

THE opinions of Woltersdorf are principally these :

That Soil proceeding from vegetable or animal substances passes gradually into clay, *n.* 6. : but this appears to want demonstration.

That all Rock, when struck against steel, gives out sparks, *n.* 13.

That Pumice-stone is not the product of volcanos, *n.* 14.

That the Lapis atramentarius is produced by eroded vitriol, *n.* 24.

That Cobalt is of the same genus with arsenic, *n.* 30.

That true native Iron no where exists, *n.* 34.

Linné was doubtless the first who, according to the laws of System, endeavoured to reduce the science of Mineralogy into Classes and Orders. *Pref.*

He divides Spar into three distinct genera, or more properly into three orders; Vitrescent, Gypseous, and Alcaline.

The SYSTEM of CARTHEUSER. *Frankfort. 1755.*

## I. EARTHS.

1. *Diffoluble.*  
Clay.  
Marl.  
Smectis.  
Moracht.  
Tripela.
2. *Indissoluble.*  
Chalk.  
Lithomarg.  
Sand.

## II. STONES.

1. *Lamellous.*  
Spar.  
Mica.  
Talc.
2. *Filamentous.*  
Amianth.  
Asbestus.  
Inolith.
3. *Solid.*  
Silex.  
Quartz.  
Lime-stone.  
Gyps.  
Fissile.  
Smectis.
4. *Granulate.*  
Sand-stone.  
Jasper.

## III. SALTS.

1. *Alcalies.*  
Fixed.  
Volatile.
2. *Acids.*  
Vitriolic.  
Nitrous.  
Muriatic.
3. *Intermediate.*  
Rock salt.  
Natrurn.  
Nitre.  
Ammonia.
4. *Styptic.*  
Alum.  
Vitriol.

## IV. INFLAMMABLES.

1. *Genuine.*  
Bitumen.  
Sulphur.
2. *Spurious.*  
Soil.

## V. SEMIMETALS.

1. *Not malleable.*  
Bismuth.  
Cobalt.  
Arsenic.  
Antimony.
2. *Submalleable.*  
Zinc.
3. *Fluid.*  
Mercury.

## VI. METALS.

1. *Flexile.*  
Lead.  
Tin.
2. *Hard.*  
Copper.  
Iron.
3. *Fixed.*  
Silver.  
Gold.

## VII. HETERO. MORPHS.

1. *True petrifications.*  
Anthropolith.  
Zoolith.  
Ornitholith.  
Ichthyolith.  
Amphibiolith.  
Entomolith.  
Helmintholith.  
Zoophytolith.  
Conchyliolith.  
Coralliolith.  
Phytolith.
2. *Spurious petrifications.*  
Typolith.  
Metrolith.  
Incrustation.  
Induration.  
Terrefaction.
3. *Figured.*  
Lithomorph.  
Lithoglyph.



The SYSTEM of JUST. *Goettingen.* 1757.

I. METALS.	V. PETRIFAC- TIONS.	Chalcedony.
1. <i>Noble.</i>	1. <i>Animals.</i>	Onyx.
Gold.	Terrestrial.	Sardonyx.
Silver.	Aquatic.	Malachite.
2. <i>Ignoble.</i>	2. <i>Plants.</i>	L. Lazuli.
Copper.	Terrestrial.	3. <i>Ignoble.</i>
Iron.	Marine.	Talc.
Tin.	3. <i>Obscure.</i>	Mica.
Lead.	Belemnite.	Molybdæna.
II. SEMIMETALS.	Hysserite.	Muscovy glass.
Quicksilver.	Jews-stone.	Soap-stone.
Antimony.	Asteria.	Jasper.
Bismuth.	Toad-stone.	Asbestos.
Zinc.	Oolithe.	4. <i>Calcareous.</i>
Arsenic.	4. <i>Figured.</i>	Marble.
III. PHLOGISTIC.	Eagle-stone.	Gypsum.
1. <i>Fluid.</i>	5. <i>Crystals.</i>	Spar.
Fitumen.	Quartzose.	5. <i>Vitrescent.</i>
2. <i>Hard.</i>	Gypseous.	Sand-stone.
Coal.	Spatose.	Quartz.
3. <i>Mineralized.</i>	V. TERRENE.	Silex.
Sulphur.	1. <i>Noble.</i>	Schist.
IV. SALTS.	Diamond.	Serpentine.
1. <i>Acids.</i>	Sapphire.	Tripoli.
Vitriol.	Emerald.	Pumice-stone.
Alum.	Amethyst.	Granite.
2. <i>Alcalis.</i>	Topaz.	Rock.
Fixed.	Turcois.	Clay.
Volatile.	Opal.	Marble.
3. <i>Intermediate.</i>	Chrysolith.	Mud.
Muria.	Hyacinth.	Umbre.
Nitre.	2. <i>Seminoble.</i>	
Borax.	Crystal.	
Ammoniac.	Carneleon.	
	Agate.	

He considers Cobalt as a species of Arsenic.

The SYSTEM of CRONSTEDT. *Stockholm. 1758.*

## I. EARTHS.

1. *Calcareous.*  
Pure.  
Vitriolaceous.  
Phlogistic.  
Argillaceous.
2. *Siliceous.*  
Diamond.  
Sapphire.  
Topaz.  
Emerald.  
Quartz.  
Silex.  
Jasper.
3. *Granatine.*  
Granate.  
Bafalt.
4. *Argillaceous.*  
Porcellane.  
Lithomarg.  
Bole.  
Tripoli.  
Clay.
5. *Micaceous.*  
Pure Mica.  
Martial Mica.

6. *Fluors.*

- Indurated.  
7. *Asbestine.*  
Asbestus.  
Amiant.  
8. *Zeolithic.*  
Pure Zeolite.  
Metallic Z.  
9. *Magnesiatic.*  
Earthy M.  
Indurated M.

## II. SALTS.

1. *Acids.*  
Vitriol.  
Muria.
2. *Alcalines.*  
Fixed.  
Volatile.

## III. PHLOGISTIC.

- Ambergris.  
Amber.  
Petroleum.  
Earthy Phlog.  
Metallic Phlog.

## IV. METALS:

1. *Perfect.*  
Gold.  
Silver.  
Platina.  
Tin.  
Lead.  
Copper.  
Iron.
2. *Semimetals.*  
Quicksilver.  
Bismuth.  
Zinc.  
Antimony.  
Arsenic.  
Cobalt.  
Nickel.

THE System of Cronstedt is merely metallurgic, investigated upon Chemical principles, peculiar and not compiled.

Many genera are excluded, as Sand-stone, Schist; Soil, Toph; Stalactite, Eagle-stone, Calculus, Nitre. In the appendix are added, Rock, Pumice-stone, and Petrifications.

He supposes Earths to be siliceous, granatine, micaceous, magnesian, zeolithic, chrysolampadine.

He denies that Crystals originate from salts, and considers their figures to be rather curious than useful; and supposes that earths may assume a crystalline figure without salt, for if the crystallization of metals are produced by fusion, the cause of crystallization is not in salts.

He doubts whether the colours of Gems have their origin from metals.

He believes that Calx existed before animals and vegetables,

He denies that the strata of the earth are uniform.

Characteristic definitions he considers useless.

The SYSTEM of VOGEL. *Leipfic.* 1762, & 1776.

## I. EARTHS.

1. *Argillaceous.*  
Clay.  
Bole.  
Mud.  
Smectis.  
Lithomarg.  
Tripoli.
2. *Calcareous.*  
Chalk.  
Lac Lunæ.
3. *Siliceous.*  
Sand.
4. *Margaceous.*  
Marl.
5. *Selenitic.*  
Fossile farina.  
Spatose earth.  
Fossile nikel.
6. *Talcofe.*  
Ta'cofe earth.
7. *Micaceous.*  
Mica.  
Gold.  
Silver.  
Russian glafs.  
Molybdæna.
8. *Inflammables.*  
Sulphureous.  
Bituminous.  
Umbre.
9. *Saline.*  
Vitriolic.  
Aluminous.  
Nitrous.  
Muriatic.

10. *Metallic.*

- Gold.  
Silver.  
Lead.  
Tin.  
Copper.  
Iron.  
Iron Mica.  
O. hre.  
Iron.  
Copper.  
Cadmia.  
Cobalt earth.  
Arfenic—  
Mercurial—

11. *Soil.*

- Rural earth.

## II. STONES.

1. *Argillaceous.*  
Steatite.  
Nephritic.  
Serpentine.
2. *Calcareous.*  
Lime-stone.  
Swine-stone.  
Stephen's-stone.  
Marble.  
Quadrum.  
Armenian.
3. *Margaceous.*  
Dendritic.  
Gypseous.  
Toph.
4. *Selenitic.*  
Gyps.  
Alabaster.

5. *Pyromachi.*

- Sand-stone.  
Silex.  
Horn-stone.  
Quartz.

6. *Schistose.*

- Argillous.  
Calcareous.  
Metallic.  
Aluminous.

7. *Leafy.*

- Micaceous.  
Spatose.  
Pseudogalena.

8. *Feathery.*

- Amiant.  
Asbestus.

9. *Saline.*

- Atramentarius.  
Aluminous.  
Ammoniacal.

10. *Metallic.*

- Si ver.  
Lead.  
Iron.  
Tin.  
Copper.  
Zinc.

11. *Fusile.*

- Pumice-stone.  
Zeolith.

12. *Rocks.*

13. *New.*  
Trap.

## III. PETRIFICATIONS.

1. *Animals.*

Anthropolith.  
Zoolith.  
Ornitholith.  
Entomolith.  
Ichthyolith.  
Helmintholith.  
Amphibiolith.  
Zoophytolith.

2. *Plants.*

Phytotopolith.  
Lythoxylon.  
Rhizolith.  
Lithocalamas.  
Lythophyllum.  
Carpolith.

3. *Lythophytes.*

Madrepore.  
Millepore.  
Tubipore.  
Keratophyte.

4. *Lithotomi.*

Eagle-stone.  
Variolith.

5. *Pori.*

Toph.  
Stalactite.  
Incrustation.

## IV. SALTS.

1. *Styptic.*

Vitriol.  
Alum.

2. *Fusile.*

Nitre.  
Bitter salt.  
Uincal.

3. *Hardened.*

Rock salt.

4. *Volatile.*

Ammoniac.  
Arsenic.

5. *Alcaline.*

Persian salt.  
Aphronitre.  
Sal Cretæ.

## V. COMBUSTIBLES.

1. *Sulphurous.*

Sulphur.

2. *Bituminous.*

Bitumen:  
Jet.  
Amber.  
Copal.  
Ambergris.  
Coal.

3. *Serum.*4. *Balsamum.*

## VI. METALS.

1. *Perfect.*

Gold.  
Silver.  
Lead.  
Tin.  
Copper.  
Iron.

2. *Semimetals.*

Zinc.  
Bismuth.  
Antimony.  
Cobalt.  
Quicksilver.  
Platina.

The SYSTEM of VELTHEIM. *Brunswick.* 1781.

## I. METALS.

## 1. PERFECT.

a. *More fixed.*

Gold.

Platina.

Silver.

b. *Less fixed.*

Lead.

Copper.

Iron.

Tin.

Zinc.

## 2. IMPERFECT.

Mercury.

Bismuth.

Nickel.

Arsenic.

Antimony.

Cobalt.

Magnesia.

Molybdæna?

Wolfram?

## 4. CONSISTING of Acid &amp; volatile Alkali.

Ammoniac.

## 5. CONSISTING of Acids &amp; Earth.

Bitter salt.

Alum.

Sal cretæ.

Sedative salt.

Gyps.

Ponderous spar.

Mineral fluor.

## 6. CONSISTING of Acid &amp; Inflammables.

Vitriolic Acid of China.

Minerals of arsenic.

Sulphur.

Amber.

Orpiment.

Risigallum.

## 7. ALCALIES.

Mineral.

Vegetable of mineral waters.

## II. SALTS.

## 1. CONSISTING of Acid and Metal.

The more common Vitriols.

Argentum corneum.

Sublimate of Mercury.

Flowers of Cobalt.

Flowers of Bismuth.

Phosphorescent Pseudogalena.

Spar of Lead.

Iron of mineral waters.

## 2. CONSISTING of Acid &amp; mineral Alkali.

Muria.

Glaubers salt.

Borax.

## 3. CONSISTING of Acid &amp; vegetable Alkali.

Nitre.

## III. EARTHS.

## 1. MORE simple.

a. *Siliceous quartose.*

Diamond.

Ruby.

Sapphire.

Topaz.

Beril.

Emerald.

Crysolite.

Tourmalin.

Hyacinth.

Garnet.

Amethyft.

Prase.

Morion.

Crystal.

Diaphanous quartz.

Quartose petrification.

- Volcanic glafs.  
*Siliceous horny.*  
 Nephritic.  
 Chalcedony.  
 Cornelian.  
 Onyx.  
 Sardonyx.  
 Cat's-eye.  
 Lapis ophthalmicus.  
 Agate.  
 Pyromachus.  
 Horn-stone.  
 Petrifications.  
 Lavas refembling Horn-  
 stone.  
*Siliceous jafpideous.*  
 Heliotrope.  
 Egyptian pebble.  
 Black jafper.  
 Petrifications.  
 Lavas refembling jafper.  
 b. *Aluminar.*  
 Native alum earth.  
 Mountain leather.  
 Mountain cork.  
 Lithomarg.  
 Porcellane earth.  
 Pipe clay.  
 Bole.  
 Miraculous earth of  
 Saxony.  
 Fuller's earth.  
 Effervelcent argill  
 Umber.  
 Rubric.  
 Mica.  
 Schorl.  
 Black chalk.  
 Pure fchift.  
 Immature jafper.  
 Aluminous petrifications  
 Aluminous lavas.  
 c. *Muriatic.*  
 Tripeli.  
 Spanifh chalk.  
 Briancon chalk.  
 Steatite.  
 Serpentine.  
 Pot-ftone.  
 Talc.  
 Afbeftus.  
 Pumice-ftone.  
 Filtering-ftone.  
 d. *Pure calcareous.*  
 Mineral agaric.  
 Chalk.  
 Osteocolla.  
 Traventine ftone.  
 Lime-ftone.  
 Lumachella.  
 White marble.  
 Calcareous spar.  
 Calcareous ftalactite.  
 Calcareous petrification.  
*Mixed with acids.*  
 Alabafter.  
 Gyps.  
*Mixed with metals.*  
 Turcois.  
 Malachite.  
 Sparry iron.  
 Sparry tin.  
*Mixed with inflammable.*  
 Swine-ftone.  
 Wallerblend.  
 Variegated marble.  
 2. COMPOUND, of filiceous  
 and calumine Earths.  
 Opal.  
 Oculus mundi.  
 Chryfoprafe.  
 Scintillating spar.  
 Quartz, greafy & opaque.  
 Variegated jafper.  
 Pudding-ftone.  
 Porphyry.  
 Granite.  
 Gneifs.  
 Murekstein.  
 Lap. ftaterius.

Spurious filtering stone.

Sand-stone.

Common argill.

A few breccia.

A few lavæ.

*Of siliceous and muriatic earths.*

Almond-stone.

Ophites.

A few breccia.

A few lavæ.

*Of siliceous and calcareous earths.*

Almond stone in a calcareous nucleus.

Lapis laxuli.

Pitch stone.

*Of aluminar and muriatic earths.*

Peperino.

Cement.

Puzzolane earth.

A few lavæ.

*Of aluminous and calcareous earths.*

Ponderous spar.

Marl.

Impure ardesia.

*Of muriatic calcareous earths.*

Aschengebirge.

Salz-stein.

Tophs of warm springs

*Of siliceous aluminous & muriatic earths.*

Basalt.

A few schists.

A few breccia.

*Of siliceous aluminous & calcarious earths.*

Zeolith.

Mineral fluor.

A few breccia.

Common mud.

*Of siliceous muriatic & calcareous earths.*

Peperino di Marino.

Grunstein.

Rock cinereous breccia.

A few schists.

*Of aluminous muriatic and calcareous earths.*

Trap.

Sand-stone.

Ancient schist.

A few breccia.

*Of siliceous, aluminous, muriatic and calcareous earths.*

Porphyrel.

Metalliferous rock.

A few breccia.

Soil.

#### IV. INFLAMMABLES.

1. SULPHURS.

2. PETREOLA.

3. AMBERS.

4. BITUMENS.



The SYSTEM of BERGMAN. *Leips. & Dresden. 1782.*

## I. SALTS.

1. *Acid.*

Vitriolic.  
Nitrous.  
Muriatic.  
Fluoric.  
Arsenic.  
Molybdænic.  
Barytic.  
Phosphoric.  
Boracic.  
Succinic.  
Aereal.

2. *Alcaline.*

Mineral.  
Volatile.

3. *Neutral.*

Nitre.  
Salt of Sylvius.  
Glaubers salt.  
Quadrangular nitre.  
Common salt.  
Sal secret. Glaub.  
Fuming nitre.  
Ammoniacal salt.  
Borax.  
Black alcalies.

4. *Terrestrial.*

Ponderous spar.  
Muriate of ponderous spar.  
Gypsum.  
Calcareous nitre.  
Fixed ammoniacal salt.  
Aerated calx.  
Bitter salt.  
Muriated magnesia.  
Nitrated magnesia.  
Aerated magnesia.  
Alum.

5. *Metallic.*

Vitriol of copper.  
Vitriol of iron.

Aerated iron.

Vitriol of zinc.

Vitriol of nickel.

Muriated magnesium.

6. *Triple combinations.*

Common salt mixed with  
muriated magnesia.

Bitter salt mixed with vi-  
triol of iron.

Alum mixed with vitriol of  
iron.

Ferrous vitriol of copper.

Vitriol of iron mixed with  
nickel.

Vitriol of copper mixed  
with iron and zinc.

## II. EARTHS.

1. *Ponderous.*

Aerated.

Vitriolated.

Combined with Petroleum.  
Lapis hepaticus.

2. *Calx.*

Aerated.

Aerated and combined with  
Petroleum. Lap. fuillus.

Fluorated.

Aerated pecul. impregnated  
with Lap. ponder.

Aerated magn. impregnated  
with salited.

Aerated impregnated with  
siliceous.

Aerated impregnated with  
argillaceous and silice-  
ous.

Aerated impregnated with  
iron and magnesia.

3. *Magnesia.*

Aerated united with sili-  
ceous.

Aerated united intimately with siliceous.

United with argillaceous, siliceous and pyrites.

United with argillaceous, siliceous, pyrites and petroleum.

4. *Argill.*

United with siliceous, porcellane.

United with siliceous and martial.

United with siliceous and calcareous.

United with siliceous and magnesian.

Impregnated with acid of sulphur and vegetable alkali.

Impregnated with siliceous, pyritaceous and petroleum.

United with siliceous, less than half of ponderous and a little calx; gem.

United with half siliceous and a little aerated calx; schorl.

Laxly united with half siliceous and a little calx; zeolith.

United with the greater part siliceous and magnesia; mica.

5. *Siliceous.*

Argill and a very little calx; quartz.

United with argill; chalcedony.

United with argill highly impregnated with iron.

United with argill and a little calx.

United with argill and a little magnesia.

United with magnesia, fluorated and aerated calx; copper and calcined iron; chrysopease.

### III. BITUMENS.

1. *Sulphur.*

Common.

Plumbago.

Molybdænum.

2. *Petroleum.*

3. *Diamond.*

### IV. METALS.

Gold.

Platina.

Silver.

Quicksilver.

Lead.

Copper.

Iron.

Tin.

Bismuth.

Nickel.

Arsenic.

Cobalt.

Zinc.

Antimony.

Magnesium.

### APPENDIX I.

#### DOUBLE COMBINATIONS.

1. *Saline*, with a saline, terrestrial, bituminous, metallic.

2. *Terrestrial*, with a terrestrial, bituminous, metallic.

3. *Bituminous*, with a bituminous, metallic.

## APPENDIX II.

## PETRIFACTIONS.

4. *Metallic*, with a bituminous, metallic.

Saline calx under an organic form.

Saline iron under an organic form.

Aerated calx under an organic form.

Argill under an organic form.

Siliceous earth under an organic form.

Organic earth.

Petroleum containing organic bodies.

Silver under an organic form.

Quicksilver under an organic form.

Copper under an organic form.

Iron under an organic form.

Zinc under an organic form.

## TRIPLE COMBINATIONS.

1. *Saline*, with a terrestrial & bituminous, terrestrial and metallic, bituminous and metallic.
2. *Terrestrial*, with a bituminous and metallic.

## QUADRUPLE COMBINATIONS.

*Saline*, with a terrestrial, bituminous, and metallic.

## The SYSTEM of KIRWAN. 1794.

## I. EARTHS.

1. *Calcareous.*

Native lime.  
Aerated calx.  
Agaric mineral.  
Chalk.  
Arenaceous lime-stone.  
Testaceous tufa.  
Compact lime-stone.  
Swine-stone.  
Oviform.  
Baryto-calcite.  
Muri-calcite.  
Argillo-calcite.  
Marl.  
Marlite.  
Pyritaceous lime-stone.  
Argentine.  
Sidero-calcite.  
Ferri-calcite.  
Elastic marble.  
Gypsum.  
Fluor.  
Phosphorite:  
Tungsten.

2. *Barytic.*

Baroselenite.  
Liver-stone.

3. *Muriatic.*

Kiffekil.  
Martial muriatic spar.  
Calci-murite.  
Argillo-murite.  
Chlorite.  
Talcite.  
Talc.  
Steatite.  
Pot-stone.  
Serpentine.  
Asbestus.  
Amianthus.

Mountain cork.

Amianthinite.

Asbestinite.

Asbestoid.

Actinolite.

Jade.

Boracite.

4. *Argillaceous.*

Native argill.  
Porcelain clay.  
Potter's clay.  
Indurated clay.  
Shiftose clay.  
Shale.  
Fuller's earth.  
Lithomarg.  
Bole.  
Argillaceous marl.  
Coloured chalk.  
Green earth.  
Umber.  
Tripoli.  
Phospholite.  
Lepidolite.  
Sapparre.  
Mica.  
Micarelle.  
Hornblend:  
Basaltine.  
Labradore hornblend.  
Schiller spar.  
Shiftose hornblend.  
Wacken.  
Mullen.  
Kragg.  
Trap.  
Basalt.  
Calp.  
Argillite.  
Novaculite.

5. *Silicious.*

Quartz.  
 Amethyst.  
 Emerald.  
 Beryl.  
 Prase.  
 Oriental ruby.  
 Spinel.  
 Occidental ruby.  
 Hyacinth.  
 Garnet.  
 Chrysoberyl.  
 Chrysolite.  
 Olivin.  
 Obsidian.  
 Shorl.  
 Tourmalin.  
 Thumerstone,  
 Phrenite.  
 Ædilite.  
 Zeolite.  
 Staurolite.  
 Rubellite.  
 Opal.  
 Semiopal.  
 Pitchstone.  
 Hydrophanes.  
 Hyalite.  
 Calcedony.  
 Cat's-eye.  
 Flint.  
 Hornstone.  
 Schistose hornstone.  
 Siliceous schist.  
 Basamite.  
 Hornslate.  
 Jasper.  
 Egyptian pebble  
 Sinople.  
 Porcellanite.  
 Heliotrope.  
 Woodstone.  
 Elastic quartz.  
 Felspar.

Labradore-stone.

Petrilite.

Felsite.

Argentine felspar.

Redstone.

Siliceous spar.

Agate.

Stronthian.

Jargon.

Sidneia.

Adamantine earth.

6. *Aggregate stones.*

Granite (quartz, felspar, mica).

Sienite (quartz, felspar, hornblend, or quartz, felspar, hornblend, mica).

Granatine triplets, formed of any triple aggregation of quartz, felspar, mica, schorl, jade, hornblend, garnet, serpentine.

Norka or murker (quartz, mica, garnet).

Grunsten (hornblend and mica, hornblend and felspar).

Granitell (duplicates).

Stelstein (quartz & mica).

Rapikivi (felspar & mica).

Granilite (aggregates of four).

Gneiss.

Schistose mica (quartz and mica).

Porphyry.

Amygdaloid.

Pudding-stone.

Sand-stones.

Rubble-stone.

Breccias.

7. *Mixed earths.*

Calcareous.

Lime-stones.

Calces of iron.

Spars.

Marls.

Gypsum.

*Muriatic.*

Pot-stone.

Steatites.

Calciferous asbestinite.

Serpentine.

*Argillaceous.*

Trap.

Argillite.

Hornblend slate penetrated  
with talc or mica.

Hornblend, penetrated with  
garnets.

Hornblend slate, penetrated  
with an excess of quartz

Trap passing into granite.

Ferruginous argillite.

Argillite with an excess of  
argill.

*Siliceous.*

Iron shot quartz.

Earthy quartz.

Earthy quartz, penetrated  
with yellowish-green actinolite.

Earthy hornstone.

Ferruginous hornstone.

Siliceous shift, penetrated  
with argillite, mullen, or  
lime-stone.

Pitchstone, penetrated with  
opal.

Granite, penetrated with  
argillite.

## APPENDIX I.

Diamond.

## APPENDIX II.

Lavas.

Enamels.

Pouzzolana.

Terras.

Tufas.

Piperino.

Pumice.

Zeolites.

Traps and basalts.

## II. SALTS.

### 1. *Acid.*

Carbonic.

Vitriolic.

Sulphureous.

Nitrous.

*Muriatic.*

Sparry.

Phosphoric.

Arsenical.

Boracic.

Molybdænous.

Tungstænic.

Succinous.

### 2. *Alcaline.*

Vegetable.

Mineral.

Volatile.

### 3. *Neutral.*

Tartar-vitriolate.

Glauber's salt.

Vitriol ammoniac.

Epsom salt.

Allum.

Alluminous ores.

Vitriol of iron.

Vitriol of copper.

Vitriol of zinc.

Mixed vitriol of iron.

Copper and zinc.

Nitre.

Nitrated soda.

Nitrous ammoniac.

Nitrated calx

Nitrated magnesia.

Salt of Sylvius.

Common salt.

Sal ammoniac.

Muriated barytes.

Muriated calx.  
 Muriated magnesia.  
 Muriated argill.  
 Muriated iron.  
 Muriated copper.  
 Muriated manganese.  
 Borax, tincal.

### III. INFLAMMABLES.

1. *Aerial*.  
 Inflammable.  
 Hepatic.
- 2 *Bituminous*.  
 Naphtha.  
 Petrol.  
 Mineral tar.  
 Mineral pitch.  
 Maltha.  
 Mineral tallow.  
 Mineral cahoutchou,
3. *Carbonaceous*.  
 Coal.  
 Plumbago.  
 Carbonated wood.  
 Turf and peat.
4. *Vegeto-bituminous*.  
 Jet.  
 Amber.  
 Ambergris.

Copal.  
 Honey-stone.  
 Sulphur.

### IV. METALS.

1. *Perfect*.  
 Gold.  
 Platina.  
 Silver.  
 Quicksilver.
- 2 *Imperfect*.  
 Copper.  
 Iron.  
 Lead.  
 Tin.
3. *Semimetals*.  
 Zinc.  
 Antimony.  
 Arsenic.  
 Bismuth.  
 Cobalt.  
 Nickel.  
 Manganese.  
 Uranite.  
 Tungstenite.  
 Molybdænite.  
 Sylvanite.  
 Menachanite.  
 Titanite.

## The SYSTEM of WERNER. 1789.

## I. EARTHS.

1. *Silicious.*

Lapis Diaboli.  
 Diamond.  
 Chrysoberyl.  
 Jargon.  
 Hyacinth.  
 Chrysolith.  
 Garnet.  
 Ruby.  
 Sapphire.  
 Topaz.  
 Emerald.  
 Beryl.  
 Schorl.  
 Lap. thumensis.  
 Quartz.  
 Pyromachus.  
 Chalcedony.  
 Lythoxylon.  
 Heliotrope.  
 Chrysoprase.  
 Schistous flix.  
 Obsidian.  
 Cat's-eye.  
 Phrenite.  
 Zeolite.  
 Lapis Lazuli.

2. *Argillaceous.*

Pure argill.  
 Porcelane earth.  
 Common argill.  
 Jasper.  
 Opal.  
 Pitchstone.  
 Adamantine spar.  
 Felspar.  
 Argillous schist.  
 Inflammable schist.  
 Aluminous earth.

Aluminous schist.

Aluminous stone.

Nigrica.

Coticula.

Tripoli.

Mica.

Chlorite.

Chalcolite.

Hornblend.

Wacce.

Bafalt.

Lava.

Pumice.

Veronese argill.

Lithomarg.

Mountain soap.

Ochre.

3. *Talcs.*

Steatite:

Nephrite.

Fuller's earth.

Plastic talc.

Asbestus.

Cyanite.

Actinote.

4. *Calcareous.*

Caëtifform.

Chalk.

Marble.

Compact M.

Lameilous M.

Stalactite M.

Pisolate M.

Schistaceous spar.

Magnesiæ spar.

Swinestone.

Marl.

Bituminous margaceous  
schist.



Phosphorated earths.

Apatite.

Boracated earths.

Boracite.

Fluorated earths.

Mineral fluor.

Vitriolated earths.

Gypsum.

Selenite.

5. *Ponderous.*

Witherite.

Ponderous spar.

## II. SALTS.

1. *Vitriolic.*

Native vitriol.

Halotrichum.

Butyraceous alum.

Native salamur.

2. *Nitrous.*

Common nitre.

3. *Muriatic.*

Common salt.

Sal ammoniac.

4. *Borax.*

5. *Alcalies.*

Native mineral alkali.

## III. INFLAMMABLES.

1. *Bitumens.*

Naphtha.

Petrol.

Asphalt.

Coal.

Spissexylon.

Amber.

Meliedite.

2. *Sulphurs.*

Common native sulphur.

Volcanic native sulphur.

3. *Graphites.*

## IV. METALS.

Platinum.

Gold.

Quicksilver.

Silver.

Copper.

Iron.

Lead.

Tin.

Bismuth.

Zinc.

Antimony.

Cobalt.

Nickel.

Magnesia.

Molybdænum.

Arsenic.

Woolfram.

## The SYSTEM of SCHMEISSER.

London. 1795.

## I. EARTHS AND STONES.

1. *Zircon.*
2. *Adamantine spar.*
3. *Siliceous.*  
Sapphire.  
Ruby.  
Topaz.  
Hyacinth.  
Aquamarine beryl.  
Emerald.  
Garnit.  
Chrofolith.  
Olivin.  
Cross-stone.  
Shorl.  
Thumerstone.  
Quartz.  
Flint.  
Chert.  
Calcedony.  
Onyx.  
Sardonyx.  
Chrysoptase.  
Avanturin.  
Jasper.  
Siliceous shift.  
Obsidian.  
Variolit.  
Felspar.  
Opal.  
Pitch-stone.  
Phrenit.  
Zeolite.  
Lapis Lazuli.

4. *Argillaceous.*  
Pipe clay.  
Porcellane clay.  
Pure native clay.  
Lithomarge.  
Potters clay.  
Painters clay.  
Bole.  
Sope-rock.  
Slaty clay.  
Argillaceous shift.  
Bituminous shift.  
Aluminous earth.  
Aluminous shift.  
Rock alum.  
Black chalk.  
Whetstone.  
Tripoli.  
Mica.  
Cianit.  
Hornblend.  
Trap.  
Basalt.  
Tuffwacke.  
Pumice-stone.  
Lava.
5. *Magnesian.*  
Sope-stone.  
Talc.  
Chlorit.  
Serpentine.  
Nephrite.  
Lapis muriaticus.  
Asbestus.  
Mountain wood.  
Radiated or striated shorl.

Tremolit.  
Spuma maris.

6. *Calcareous.*

Chalk.  
Lime-stone.  
Tofus.  
Calcareous spar.  
Brown spar.  
Plated spar.  
Pearl spar.  
Stellated spar.  
Marl.  
Bituminous marl shift.  
Swine-stone.  
Apatite.  
Phosphorated lime-stone.  
Boracit.  
Fluor.  
Selenite.  
Selenitic spar.  
Marble.

7. *Barytic.*

Carbonate of baryt.  
Sulphate of baryt.  
Baryt mixed with petroleum.  
Bituminous ponderous earth.

8. *Strontion.*

9. *Sydneya.*

## II. SALTS.

1. *Acids.*

2. *Alcaline.*

3. *Neutral.*  
Sulphates.  
Nitrates.  
Muriates.  
Borates.

## III. COMBUSTIBLES.

1. *Diamond.*

2. *Bituminous.*

Naphtha.  
Coloured petroleum.  
Tar.  
Bitumen.  
Jet.  
Elastic bitumen.  
Mineral mummy.

3. *Substances chiefly employed for fuel.*

Coal.  
Bituminous wood.  
Turf.

4. *Of a different nature.*

Ambergris.  
Amber.  
Honeystone.  
Sulphur.  
Coalblende.  
Blacklead.

## IV. MOUNTAINS.

1. *Primitive.*

Granit.  
Sienit.  
Gneifs.  
Micaceous shift.  
Hornblend thist.  
Argillaceous shift.  
Pophyre.  
Pophyre shift.  
Schneidestein.  
Quartz.  
Primitive lime-stone.  
Serpentine.  
Topaz rock.  
Trapp.

2. *Regular stratified mountains.*

Wacké.  
 Bafalt.  
 Almond-stone.  
 Slaty clay.  
 Aluminous fhift.  
 Flotz lime-ftone.  
 Marl.  
 Sand-ftone.

3. *Alluvial mountains.*

Tuff ftain.  
 Bituminous wood.  
 Loam.  
 Sand.  
 Potters clay.

4. *Volcanic.*

Lava.  
 Pumice.  
 Volcanic afhes.  
 Organized earth.

## V. METALS.

1. *Perfeft.*

Platina.  
 Gold.  
 Silver.  
 Mercury.

2. *Semimetals.*

Iron.  
 Copper.  
 Tin.  
 Lead.  
 Zinc.  
 Bismuth.  
 Nickel.  
 Antimony.  
 Cobalt.  
 Manganefe.  
 Molybdæna.  
 Arfenic.  
 Woolfram.  
 Uranite.

The SYSTEM of BABINGTON. *London. 1796.*

## I. SALTS.

1. *Simple.*  
Acid.
2. *Compound.*  
Base, Potash.  
Base, Soda.  
Base, Ammoniac.

## II EARTHS.

1. *Homogeneous.*  
Lime.  
Strontian.  
Baryte.  
Magnesia.  
Argill.  
Silex.  
Adamantine E.  
Jargon E.  
Sidneian E.
2. *Mixed.*  
Calcareous.  
Magnesian.  
Argillaceous.  
Siliceous.
3. *Aggregated.*  
Calcareous.  
Magnesian.  
Argillaceous.  
Siliceous.

## III. METALS.

1. *Ductile.*  
Platina.  
Gold.  
Quicksilver.  
Silver.  
Lead.  
Copper.  
Iron.  
Tin.

2. *Fragile.*

Bismuth.  
Nickel.  
Arsenic.  
Cobalt.  
Zinc.  
Antimony.  
Manganese.  
Scheele.  
Uranite.  
Molybdæna.  
Menachanite.

## IV. INFLAMMABLES.

1. *Aeriform.*  
Hydrogen.
2. *Liquid.*  
Bitumen.
3. *Solid.*  
Bitumen.  
Amber.  
Mineral tallow.  
Sulphur.  
Plumbago.

## V. VOLCANIC PRODUCTIONS.

1. *Cinders.*  
Loose.  
Coherent.
2. *Lava.*  
Cellular.  
Compact.
3. *Vitreous Lava.*  
Glasses.  
Enamel.  
Scoriae.  
Slaggs.

## I. EXTERNAL PROPERTIES.

## I. COLOUR

1. WHITE
  - Snow-white
  - Reddish-w
  - Yellowish-w
  - Greyish-w
  - Silvery-w
  - Greenish-w
  - Blueish-w
  - Milk-w
  - Tin-w
2. GREY
  - Smoky-grey
  - Pearl-g
  - Blueish-g
  - Greenish-g
  - Yellowish-g
  - Reddish-g
  - Lead-g
  - Steel-g
  - Blackish-g
3. BLACK
  - Greyish-black
  - Bluish-b
  - Greenish-b
  - Brownish-b
  - Iron-b
  - Deep b
4. BLUE
  - Indigo-blue
  - Prussian-b
  - Azure-b
  - Smalt-b
  - Violet-b
  - Lavender-b.
  - Sky-b
  - Greyish-b
5. GREEN
  - Verdigris-green
  - Sea-g
  - Grass-g

- Apple-g
  - Leek-g
  - Olive-g
  - Pistachio-g
  - Asparagus-g
6. YELLOW
    - Sulphur-yellow
    - Lemon-y
    - Gold-y
    - Pyritaceous-y
    - Straw-y
    - Honey-y
    - Wax-y
    - Isabella-y
    - Ochre-y
    - Wine-y
    - Orange-y
  7. RED
    - Aurora-red
    - Brick-r
    - Scarlet-r
    - Hyacinth-r
    - Blood-r
    - Cochineal-r
    - Copper-r
    - Cinnabar-r
    - Carmine-r
    - Persian-r
    - Rosy-r
    - Flesh-r
    - Dull-r
    - Brownish-r
  8. BROWN
    - Reddish-brown
    - Clove-b
    - Yellowish-b
    - Tombac-b
    - Liver-b
    - Blackish-b
  9. OF THE SUR-  
FACE

Peacock colour  
Iridescent  
Dove-colour  
Steely

10. VARYING  
Varying according to the position of the light

## II. LUSTRE

Inconspicuous,  
*i. e.* devoid of  
all lustre  
Shining  
A little polished  
Polished  
Highly polished  
Common lustre  
Glassy  
Waxy  
Mother of pearl  
Adamantine  
Semimetallic  
Specular  
Metallic  
Dull

## III. TRANSPARENCY

Opake  
Subopake, or  
transparent at  
the thinner edges only  
Diaphanous  
Semitransparent  
Transparent  
Hyaline, or  
slightly tinged

## IV. COHESION

## 1. SOLID

Brittle  
 Tenacious  
 Plastic  
 Somewhat ductile  
 Ductile  
 Tough  
 Flexile  
 Elastic  
 Very soft, or receiving the impression of the nail  
 Soft, or yielding to the knife  
 Hardish, or yielding with difficulty to the knife.  
 Hard, or striking fire with steel  
 Very hard, or resisting the file

## V FRACTURE

## 1. COMPACT

Shivery  
 Glassy  
 Flat  
 Conchoidal  
 Scoriaceous  
 Granular  
 Splintery  
 Earthy

## 2. FIBROUS

Thinner  
 Thicker  
 Straight  
 Curved  
 Parallel  
 Divergent  
 Stellate

Fascicled  
 Scattered

## 3. RADIATE

*Rays*  
 Broad  
 Narrow  
 Long  
 Short  
 Straight  
 Curved  
 Parallel  
 Divergent  
 Fascicled  
 Stellate  
 Spinous

## 4. LAMELLAR

*Plates*  
 Straight  
 Curved  
 Undulate  
 Spherico-convex  
 Frondose  
 Parallel  
 Divergent  
 Cutting each other,

doubly  
 threefold  
 fourfold  
 sixfold

## 5. SLATY

*Parts*  
 Thinner  
 Thicker  
 Straight  
 Curved  
 Undulate

## VI. SURFACE

Greasy  
 Dry  
 Cold  
 Coldish  
 Tepid  
 Unequal

Smooth

Coarse

Rough with minute equal granulations

Pitted, with hollows  
 cubic

pyramidal  
 tubular  
 conic

spherical

Striate

transversely  
 longitudinally  
 diagonally  
 alternately  
 decussately  
 feathered

## VII. GRAVITY

Very ponderous, or in specific gravity exceeding water by at least six times

Ponderous, or exceeding water in specific gravity at least four times

Lightish, specifically heavier than water twice, or something more

Light, specifically heavier than water but not floating  
 Floating, specifically lighter than water

## VIII. FIGURE

### 1. REGULAR, with

Faces.

Edges

Angles

### 2. PARTICULAR

Globular

Ovate

Oval

Flattened

Amygdaloid

Lenticular

Wedge-shaped

Botryoid

Dentiform

Wire-form

Capillary

Reticular

Dendritic

Shrub-form

Coralloid

Stalactitical

Clavate

Fasciform

Tubular

### 3. AMORPHOUS

Without regu-

lar or particu-

lar shape

## IX. SITUATION

Rupestrial

Composing en-

tire mountains

or their chief

parts

Parasitic

Loose

Scattered

Adherent

Inherent

## X. COLOUR

Of which 2

mark is left on  
other bodies,  
by inscription  
trituration

## XI. TASTE

Adhesive

Insipid

Sapid

Argillaceous

Sweetish

Stiptic

Bitter

Lixivious

Salt

Acrid

## XII. ODOUR

## XIII. SOUND

Mute

Sonorous

## II. PHYSICAL PROPERTIES.

Attractorial,

attracting iron

Retractorial,

attracted by the

magnet

Intractable,

not attracted by

the magnet

Electrical,

attracting straws

or light particles

when heated or

rubbed

Phosphorescent

Humefcent,

gradually im-

bining water

Bibulous,

absorbing gree-

dily water

Faifcent,

spontaneously

falling to pieces

in the air

## III. CHEMICAL PROPERTIES.

### 1. BY FIRE

Volatile,

dispersing in va-

pours by a small-

er degree of heat

Semivolatile,

dispersing in va-

pours when

thrown upon red

hot coals

Smoking,

emitting smoke

when burnt

Scintillant,

emitting sparks of

fire when burnt

Inflammable,

flaming when

burnt

Variable,

losing or chang-

ing its colour

when exposed to

heat



Decrepitant,  
crackling when  
burnt

Detonant,  
emitting an ex-  
plosion when  
burnt

Spumefcent,  
frothing when  
exposed to heat

Intumescent,  
swelling when  
exposed to heat

Liquiable,  
becoming liquid  
by heat

Vitrescent,  
fusible by fire  
into glass

Calcinable,  
deprived of the  
cohesion of its  
parts by fire

Hardening by fire

Apyrous,  
not liquefying in

the greatest de-  
gree of heat

## 2. BY SOLVENTS

Effervescent in  
solution

Not effervescent

Soluble, or not  
soluble

Solvents,  
in the humid way  
in the dry way

## IV. INSTRUMENTS, AND MENSTRUUMS.

A knife

File

Steel

Hammer

Small pair of tongs

Magnifying glass

Blowpipe

Agate mortar

Magnet

Touchstone

Diamond

Acids

Alcalies

Solutions of metals

Tincture of galls

Highly rectified  
alcohol

Nitre.

Calcined borax

Microsmic salt

Soda

Litmus paper

Turmeric paper

Evaporating basins

Filtering paper

Lamps and furnace  
for assaying

## The SYSTEM of GMELIN.

## I. EARTHS.

## A. SIMPLER.

## I. TALCOSE.

a. *greasy*.

1. Talcum.
- b. *dry and meagre*.
2. Serpentinus.
3. Asbestus.
4. Actinotus.
5. Hornblenda.

## II. PONDEROUS.

6. Barytes.
7. Crossopetra.
8. Strontia.
9. Sydneya.

## III. CALCAREOUS.

a. *purcr*.

10. Creta.
11. Tophus.
12. Spathum.
13. Schistolithus.
14. Inolithus.
15. Stalactites.
16. Pisolithus.
17. Marmor.

b. *less pure*.† *effervescing*.

18. Suillus.
19. Tremolites.
20. Stellaris.
21. Humus.
22. Marga.
23. Magnesiata.
- †† *not effervescing*.
24. Gypsum.

25. Hepaticus.
26. Lazarus.
27. Fluor.
28. Apatites.
29. Boracites.

## IV. ARGILLACEOUS.

30. Aluminaris.
31. Argilla.
32. Puteolana.
33. Cæmentum.
34. Cariosus.
35. Ardesia.
36. Basaltes.
37. Lava.
38. Mica.
39. Opalus.
40. Zeolithus.
41. Scorlus.

## V. SILICEOUS.

a. *fixed*.† *impure*.

42. Gemma.
43. Olivinus.
44. Felspatum.
45. Pyromachus.
46. Petrosilex.
47. Jaspis.
48. Smiris.
49. Circonius.
50. Amarus.
51. Lydius.
52. Chlorogranatus.
- †† *purcr*.
53. Arena.
54. Quartzum.
55. Chalcedonius.
56. Adamus.

## VI. ADAMANTINE.

57. Adamantinus.

## B. AGGREGATE.

I. *With particles more or less crystalline, cohering by no visible intermediate cement.*

58. Granites.

59. Gneissum.

II. *With heterogeneous fragments immersed in masses of other stones.*

60. Porphyrius.

61. Amagdalites.

III. *With fragments of stone conglutinated by a cement.*

62. Breccia.

63. Arenarius.

## IV. METALS.

79. Uranium.

80. Wolframum.

81. Magnesia.

82. Stibium.

83. Zincum.

84. Molybdæna.

85. Stannum.

86. Cobaltum.

87. Ferrum.

88. Arsenicum.

89. Cuprum.

90. Niccum.

91. Wilmutum.

92. Argentum.

93. Plumbum.

94. Hydrargyrum.

95. Aurum.

96. Platina.

Appendix.

## II. SALTS.

64. Natrum.

65. Borax.

66. Muria.

67. Nitrum.

68. Mirabile.

69. Amarum.

70. Alumen.

71. Vitriolum.

## III. INFLAMMABLES.

72. Turfa.

73. Bitumen.

74. Mellites.

75. Succinum.

76. Ambra.

77. Graphites.

78. Sulphur.

## V. PETRIFACTIONS.

## I. ANIMAL.

A. *Mammalia.*

97. Anthropolithus.

98. Zoolithus.

B. *Birds.*

99. Ornitholithus.

C. *Amphibious.*

100. Amphibiolithus.

D. *Fishes.*

101. Ichthyolithus.

E. *Insects.*

102. Entomolithus.

F. *Worms.*

103. Conchyliolithus.

104. Coralliolithus.

## II. VEGETABLE.

105. Phytolithus.

I. STONES, as they evidently have their origin from hardened compact Earths, into which they again moulder, cannot without unnatural separation but be joined with them in the same class. They resist fire, the greatest degree of which is not not able to resolve any of their particles into vapour. They are all of them without taste, and most of them without odour.

1. TALCOSE, are most of them soft and very soft, principally contain Magnesia alba, and never have the vestiges of living bodies. They occur in primary mountains, more often in secondary, some compose strata or the principal parts of mountains, and others are parasitical. By the action of fire they are not calcined, nor, except Hornblenda Actinotus and ferriferous Asbestos, are they liquifiable, but become harder.
2. PONDEROUS, exceed all others in specific gravity, are more easily liquifiable by fire, always parasitical, never have the vestiges of living bodies, are soft and hardish, and chiefly consist of Terra ponderosa properly so called.
3. CALCAREOUS, some are formed of testaceous substances and corals, some are primitive, others are rupestrial or parasitic, many are filled with the vestiges of living bodies; they are very soft, soft, and hardish; become more porous by fire; the purer ones all effervesce, and are almost totally dissolved in nitrous acid or Aqua fortis.
4. ARGILLACEOUS, some are very soft, plastic, sticking to the tongue, when moistened give out a peculiar odour, hardening in the fire, and have often the impressions of animals and vegetables upon them; some are soft or hardish, and are rather liquified than hardened by fire, of which the principal part are rupestrial; others, though fewer in number, are hard, and undergo the same change by fire.
5. SILICEOUS, are hard and very hard, and, except the fluoric, are not affected by acids, certainly in part; some are rupestrial, others parasitic, and these last have often the vestiges of living bodies.
6. ADAMANTINE, is very hard, parasitical, containing an earth peculiar to itself, and hitherto detected in no other fossil.

II. SALTS, by their taste and solubility in water are known from all other mineral substances, and are distinguished among themselves by the kind of taste and the degree of their solubility.

III. INFLAMMABLES, are characterized by their solubility in oil, by their smoke or flame when burnt, which is either grateful or disagreeable, innocent or deleterious, and by their colour or teint.

IV. METALS, are known by their lustre, great weight, proper flux, and solubility in acids.

V. PETRIFICATIONS, are not fossils of themselves, but in relation to the materials which compose them: they differ from the preceding classes only in their form, which they receive from the bodies of one of the other kingdoms of nature.

## CLASS I. EARTHS.

## ORDER I. TALCOSE.

- |                 |   |
|-----------------|---|
| 1. TALCUM.      | Greasy to the touch.                                  |
| 2. SERPENTINUS. | Dry and harsh, of a shivery fracture, without lustre. |
| 3. ASBESTUS.    | Dry, fibrous, without lustre.                         |
| 4. ACTINOTUS.   | Dry, shining.   |
| 5. HORNBLENDA.  | Dry, lamellous, black.                                |

## ORDER II. PONDEROUS.

- |                 |   |
|-----------------|---|
| 6. BARYTES.     | Soluble in boiling sulphuric acid.          |
| 7. CROSSOPETRA. | Not totally soluble in sulphuric acid.      |
| 8. STRONTIA.    | Soluble in marine and diluted nitric acids. |
| 9. SYDNEIA.     | Soluble in muriatic acid.                   |

## ORDER III. CALCAREOUS.

- |                     |  |
|---------------------|--|
| 10. CRETA.          | Soling the fingers.  |
| 11. TOPHUS.         | Porous, precipitated from water.                               |
| 12. SPATUM.         | Lamellar, breaking into rhomboidal fractures.                  |
| 13. SCHISTOSPATHUM. | Undulately flaty.  |
| 14. INOLITHUS.      | Fibrous, soluble entirely with effervescence in nitric acid.   |
| 15. STALACTITES.    | Precipitated from water in the air.                            |
| 16. PISOLITHUS.     | Consisting of globular granulations.                           |
| 17. MARMOR.         | Compact or granular.   |
| 18. SUILLUS.        | Emitting an urinous smell when scraped.                        |
| 19. TREMOLITES.     | Radiate, partly soluble in nitric acid.                        |
| 20. STELLARIS.      | Fibrous in a stellate manner, easily melting in fire.          |
| 21. HUMUS.          | Friable, becoming very pale when dry.                          |
| 22. MARGA.          | Hardening by fire, and vitrifying in a greater degree of heat. |
| 23. MAGNESIATA.     | Becoming black in the fire.                                    |
| 24. PICROSPATUM.    | Lamellar, brittle, slowly effervescing with acids.             |
| 25. GYPSUM.         | Calcinable with water, hardening in the air.                   |

26. **HEPATICUS.** When scraped or exposed to heat smelling like liver of sulphur.
27. **FLUOR.** Infused in hot sulphuric acid emits a gas which corrodes and dissolves glass.
28. **APATITES.** When sprinkled on red hot charcoal emits a green phosphorescent flame, not easily melted.
29. **BORACITES.** Cubic, hard, semitransparent.

#### ORDER IV. ARGILLACEOUS.

30. **ALUMINARIS.** Dry and harsh, soluble almost entirely in nitric acid.
31. **ARGILLA.** Greasy to the touch, plastic, hardening by fire.
32. **PUTEOLANA.** Friable, hardening in the air when kneaded with water and quicklime.
33. **CÆMENTUM.** Solid, hardening in the air when pounded and kneaded with water and quicklime.
34. **CARIOSUS.** Rough, falling into powder in water.
35. **ARDESIA.** Fissile, when moistened giving out an argillaceous odour.
36. **BASALTES.** Opaque, without lustre, compact, of a dull colour, easily mouldering into pieces, melting into a blackish glass before the blowpipe.
37. **LAVA.** The produce of volcanos or subterraneous fires.
38. **MICA.** Scaly, shining.
39. **OPALUS.** Of no determinate shape when broken, compact, melting with the greatest difficulty.
40. **ZEOLITHUS.** Easily melting with ebullition, and in melting emitting a phosphorescent light.
41. **SCORLUS.** Melting, but emitting no phosphorescent light.

#### ORDER V. SILICEOUS.

42. **GEMMA.** Crystalline, hard and very hard, shining in the dark.
43. **OLIVINUS.** Easily falling to pieces in the air, melting with great difficulty.
44. **FELDSPATUM.** Lamellar, melting with soda into a transparent glass: mouldering in the air.
45. **PYROMACHUS.** Not mouldering in the air, or melting without the greatest degree of heat, breaking into convex fragments.
46. **PETROSILEX.** Melts without ebullition, of shivery fracture.

47. JASPIS. Opaque, changing its colour in the fire, not melting by itself, breaking into convex fragments.
48. LAZULUS. Hardish, opaque, of a sky-blue colour, not losing its colour or effervescing by acids sprinkled upon it.
49. SMIRIS. Of no determinate shape, melting with great difficulty, very hard.
50. CIRCONIUS. Ponderous, very shining within, breaking into incurved plates.
51. AMARUS. Tenacious, green, of shivery texture.
52. LYDIUS. Fissile, opaque, of a dull colour, and of shivery texture.
53. CHLOROGRANATUS. Green, crystalline, easily melted by fire.
54. ARENA. Consisting of dry hard rough granulations.
55. QUARTZUM. Resisting the greatest degrees of heat, and all acids except the fluoric: fragments angular.
56. CHALCEDONIUS. Resisting the greatest degrees of heat, and all acids: fragments more convex.
57. ADAMAS. Very hard, evaporating in fire with a flame.

## ORDER VI. ADAMANTINE.

58. ADAMANTINUS. Resisting heat, fixed, hard, lamellar.

## ORDER VII. AGGREGATE.

59. GRANITES. Consisting of granular particles united together without visible cement and without regular order.
60. GNEISSUM. Of a lamellar texture.
61. PORPHYRIUS. Crystalline particles imbedded in a stony paste.
62. AMYGDALYTES. Glandules more or less rounded imbedded in a stony mass.
63. BRECCIA. Fragments of stone conglutinated by a stony or metallic cement.
64. ARENARIUS. Granulations of siliceous stones conglutinated by a stony or metallic cement.



## ORDER I. TALCOSE.

1. TALCUM. Consisting principally of carbonate of magnesia, and silica and carbon: soft, greasy to the touch, not admitting a polish: hardening in the fire, not effervescing with nitric acid, absorbing oil.

- Spuma maris.* Whitish, tenacious, hardening in the air.  
*Argilla lithomerga.* *Syst. nat. xii. 3. p. 201. n. 5.*  
*Keffekil.* Myrten *Kirwan mineral. 1. p. 144.*  
*Spuma maris.* *Schmeisser mineral. 1. p. 209.*  
*Kaffekil.* Sea-froth. *Thomson's Chemistry, 1. p. 589.*  
 Found in small veins covered with soil in *Anatolia*, near *Koni*, *Thrace*, *Greece*, and *North America*: colour white and yellowish white: consistence waxy when fresh: adheres to the tongue, and absorbs water: specific gravity 1.600 contains silica 50.50. magnesia 17.25. water 25.00. carbonic acid 5.00. lime .50 *Kl. pr.* It is used to make the bowls of Turkish tobacco pipes.
- fullonum.* Tinged, tenacious.  
*Hoffmann Bergm. Journ. 1789. 1. p. 157.*  
 Found in *Cornwall* and *Bedfordshire*, *Portugal* and *Saxony*, in large masses under the common soil: colour yellowish or greenish-grey, greenish-white, green, or flesh-colour. Is used to take spots of grease out of cloth.
- porcellanum.* White with a cast of green, tenacious, forming porcelain in a greater degree of heat.  
*Guetard & Lavoisier Ad. Paris, 1778. p. 433, 434.*  
*Martial muriatic spar.* *Kirwan mineral. 1. p. 145.*  
 Found in *Lorraine* at the depth of 30 feet, in strata of 7 or 8 feet; and is used by potters in the manufacture of porcelain.
- chlorites.* Friable, scaly, green, gives an earthy smell when breathed upon, melting with a greater heat into a dark brown glass.  
*Chlorite.* Peach, *Kirwan mineral. 1. p. 147.*  
*Chlorit.* *Schmeisser mineral. 1. p. 196. Thomf. chem. 3. p. 582.*  
 Found in *Switzerland* and *Saxony*, in primitive mountains and rock crystal: colour grass or dark-green: has a scaly texture and glittering appearance.
- squamosum.* Friable, scaly, apyrous.  
*Hoffmann Bergm. Journ. 1789. 1. p. 160.*  
 Found near *Freyburg* in *Saxony*.

*radiatum.* Silvery, of a greasy lustre, composed of flexible stellate plates.

Found in the valley of *Tremola* in *Switzerland*.

*cosmeticum.* Somewhat flexible, diaphanous, undulately lamellous, shining, breaking into discoid fragments.

Mica talcosa. *Syst. nat.* xii. 3. p. 59. n. 7.

Talc. *Kirwan* 1. p. 150. *Schmeisser* 1. p. 194.

Talc. *Thomson chemist.* 3. p. 541.

Found in *Naples*, *Saxony*, *Silesia*, *Tyrol*, and *Sweden*: colour pale green, silvery, greenish grey, green, red, yellow, or yellowish: strongly heated it becomes whiter, less transparent and more brittle: contains silica 48.0 alumina 37.0 oxyde of iron 6.0. magnesia 1.5. lime 1.5. water 5.0. *Chemewix*.

*brianzonianum.* Rigid, without transparency, leaving a mark, very minutely lamellous.

Semiunderated Steatites. *Kirwan mineral.* 1. p. 151.

Spanish chalk. *Schmeisser mineral.* 1. p. 194.

Found in amorphous masses in *France* and *Spain*: colour white or greenish: absorbs but does not dissolve itself in water: hardens and whitens in the fire: contains silica 48.42 magnesia 20.84. alumina 14. iron 1. air and water 16. *Klapr.*

*Smectis.* Rigid, without transparency, shining when rubbed, leaving a white mark, of shivery fracture, subdiaphanous, apyrous.

Talcum ungue rasie. *Syst. nat.* xii. 3. p. 52. n. 4.

Soap stone. *Schmeisser mineral.* 1. p. 192.

Steatites. *Kirwan*, 1. p. 151. *Thomson chem.* 3. p. 590.

1. More solid and opaque.
2. More solid and diaphanous.
3. Softer and subdiaphanous.
4. Softer and subopaque.
5. With hexaedro-prismatic crystals terminating in a 6-sided pyramid.

Found in *Cornwall*, *China*, *Norway*, *Sweden*, *Saxony*, and *Germany*: colour white or greenish-white, greyish-green, yellowish, or reddish, sometimes veined: does not adhere to the tongue: soft and soapy, and may be cut into any shape: It melts with borax and soda into a greenish slag.

*ellaris.* Rigid, opaque, without transparency, undulately lamellous, breaking into discoid fragments.

Talcum opacum solidum. *Syst. nat.* xi. 3. p. 52. n. 5.

Pot-stone. *Kirwan*, 1. p. 155. *Schmeisser*, 1. p. 196.

Pot-stone. *Thomf. chemist.* 3. p. 582.

Found imbedded in amorphous masses in *Russia*, *Norway*, *Saxony*, and many parts of *Europe*: colour pale yellowish, or greenish-grey, reddish-grey, or speckled with red, and contains many

micaceous particles: does not diffuse itself in water, but gradually crumbles to pieces: is brittle and too hard for writing, but is made into utensils for holding water: contains silica 38. magnesia 38. alumina 7. iron 5. carbonate of lime 1. fluoric acid 1. *Weigleb.*

*schistosum.* Shining, somewhat flexile, lamellous, breaking into flakes.

*Storr. Alpenr.* 2. p. 285—289

Found in the country of the Grysons among the *Alps*: colour white, or greenish white, greenish, or greyish-green, blood-red, or dull red. It is used for covering houses.

2. SERPENTINUS. Consisting of carbonate of magnesia, oxyde of iron, and silica, with frequently a mixture of alumina, rarely of calcareous earth: dry and harsh to the touch, receiving a polish: hardening in the fire; neither effervescing with nitric acid nor absorbing oil.

*nephriticus.* Leek-green, semipellucid, a little greasy to the touch.

Talcum præpoliendum viride. *Syst. nat.* xii. 3. p. 53. n. 7.

Jade. Nephrit. *Kirwan. mineral.* 1. p. 171.

Nephrite. Jade. *Schmeisser*, 1. p. 200. *Thom.* 3. p. 581.

Found in *Egypt*, *America*, *Sweden*, *Saxony*, *Bohemia*, and the *Siberian* and *Hungarian* mountains; sometimes adhering to rocks, and sometimes in detached rounded pieces: colour dark leek-green, with often a blueish cast: is very hard, and does not melt in the strongest fire: contains silica 47. carbonate of magnesia 38. iron 9. alumina 4. carbonate of lime 2. The inhabitants of *New Zealand* use them for hatchets and other cutting instruments.

*genuinus.* Opake, without lustre, of splintery fracture, becoming whiter in the fire.

Talcum præpol. viride-maculat. *Syst. nat.* xii. 3. p. 52. n. 6.

Serpentine. *Kirwan. mineral.* 1. p. 156. *Schmeisser*. 1. p. 199.

*Thomf. chemist.* 3. p. 580.

Found in most *European* mountains, generally in large amorphous masses: colour blackish, leek, olive or canary green, yellow, red, grey, brown, white, or blue; one specimen generally exhibiting a mixture of several colours like the skin of a serpent: when breathed upon frequently emits an earthy smell: contains magnesia 34. 5. silica 28. 0. alumina 23. 0. oxyde of iron 4. 5. lime 0. 5. water 10. 5. *Chenevix.*

*fragilis.* Green, of a flaty texture.

Chlorit thillus. *Schmeisser. minera.* 1. p. 198.

Found in *Norway*, *Corfica*, and *Tyrol*, clothing the crystals of magnetic iron stone, and leaves a mountain-green trace: contains oxide of iron 43, 3. silica 41, 15. alumina 6, 13. magnesia 39, 47. lime 1, 50. air and water 1, 50.

*crystallinus*. Green, resembling acicular crystals.

Found in *Saxony* and *Sweden*, on the surface of rock crystal.

3. ASBESTUS. Consisting of carbonate of magnesia, silica, and generally alumina; with frequently oxide of iron, rarely carbonate of lime: dry to the touch, fibrous, soft, light and floating, brittle in the fire, parasitic.

A. *With all the fibres parallel.*

*Amiantus*. Floating, with very fine separable, highly flexible fibres.

*Amiantus fibrous*. *Syst. nat.* xii. 3. p. 55. n. 1.

*Amiant*. *Kirzuan mineral*. 1. p. 161.

Mountain flax. *Schmeisser mineral* 1. p. 203.

Flexible Asbestus. *Thomson's chemistry*, 3. p. 594.

Found with Serpentine in the *Ural*, *Lapland*, *Sweden*, and many *European* mountains, and likewise in *Candia* and *China*: colour silvery-white, greyish, greenish-white, yellowish, pale flesh-colour or ochre yellow: feels a little greasy to the touch, and easily melts in a candle: contains silica 64, 0. carbonate of magnesia 17, 2. carbonate of lime 12, 8. oxide of iron 6, 0. *Bergman*.

*maturus*. Harder, with the fibres more closely cohering, tenacious and separable.

*Amiantus plumosus*. *Syst. nat.* xii. 3. p. 55. n. 2.

Found in *Sweden*, and separates more into a kind of down than into distinct fibres: abounds with iron, which gives it a greenish colour: in the fire it melts into a black dross. Probably only a variety of the last.

*fragilis*. Shining like glass, with separable very fragile fibres.

*Amiantus fibrous*. *Syst. nat.* xii. 3. p. 55. n. 3.

Found in *Siberia* and *Sweden*, and is sold in the shops under the name of feathered Alum: colour grey or greenish. Taken internally it is highly deleterious, but has been sometimes applied to stimulate paralytic limbs.

*vulgaris*. Without lustre, with rigid stony cohering fibres in long bundles.

*Amiantus immaturus*. *Syst. nat.* xii. 3. p. 55. n. 4.

Asbestus. *Kirzuan mineral*. 1. p. 159.

Common Asbest. *Schmeisser mineral*. 1. p. 204.

Common Asbestos. *Thomson's chemistry*, 3. p. 594.

Found in *Siberia, Lapland, Sweden, Silesia, Saxony, Franconia, and Tyrol*, generally in wedge shaped pieces: colour green or grey: its surface can be scratched with a knife, and is not altered by fire: it melts with borax into a white glassy mass: contains silica 63, 9. carbonate of magnesia 16, 0. carbonate of lime 12, 8. oxyde of iron 6, 0. alumina 1, 1. *Bergm.*

*tortuosus.* Harder, with tortuous, rigid, closely united, fascicled fibres.

*Amiantus Solidus.* *Syst. nat.* xii. 3. p. 57. n. 10.

*Asbestos solidus.* *Wall. syst.* 1. p. 398.

Found in *Sweden*, in the *Norburg* quarries.

B. *With the fibres interwoven, and breaking into obtuse-angled fragments.*

*Suber.* Flexible, resembling cork, imbibing water with a noise, adhering to the tongue,

*Amiantus corticosus.* *Syst. nat.* xii. 3. p. 56. n. 7.

*Asbestos fibris flexilibus.* *Wall. syst.* 1. p. 400.

Mountain cork. *Schmeisser mineral.* 1. p. 202.

*Suber montanum.* *Kirwan mineral.* 1. p. 163.

Elastic Asbestos. *Thomson's chemistry*, 3. p. 594.

Found in the mines of *Sweden, Saxony, Hungary, &c.* containing often silver ores, in thick compact pieces: colour white, reddish-white, cinereous, greenish, or yellowish: the fibres are so confusedly interwoven with each other, and sometimes so subtly as to be distinguished with difficulty: it is very light, dry and elastic, and yields to the pressure of the nail: contains silica 56, 2. carbonate of magnesia 26, 1. carbonate of lime 12, 7. iron 3, 0. alumina 2, 0. *Bergman.*

*Lignum.* Resembling wood in colour and texture.

*Ligniform Asbestos.* *Kirwan mineral.* 1. p. 161.

Mountain wood. *Schmeisser mineral.* 1. p. 205.

*Ligniform Asbestos.* *Thomson's chemistry*, 3. p. 595.

Found at *Clausen*, in *Tyrol*: colour brown, and if broken across discovers an irregular filamentous structure, like wood.

*Carc.* Flexible, floating, in thick lamellar pieces.

*Amiant. corticos. flexilis.* *Syst. nat.* xii. 3. p. 56. n. 8.

Mountain Leather. *Schmeisser mineral.* 1. p. 203.

Found in the iron mines of *Sweden*, in pieces of the thickness and consistence of tanned horses' skin. colour whitish, the outer surface often consisting of very thin short crowded erect hairs, over which is a black unequal membrane. It has the appearance of a hornblend, but is immediately distinguished by its softness and colour: contains silica 56, 2. alumina 2, 0. magnesia 26, 1. carbonate of lime 12, 7. iron 3, 0. *Schmeisser.*

- Aluta.* Flexible, floating, in thin lamellar pieces.  
 Amiant. corticos. membranac. *Syst. nat.* xii. 3. p. 57. n. 9.  
 Amiant. fibris mollior. *Wall. syst.* 1. p. 399. n. 7.  
*Aluta Montana.* *Vogel mineral.* 171.  
 Found in *Siberia, Russia, Sweden, Hungary, Tyrol, France, &c.*  
 in pieces of the thickness and consistence of fine shoe-leather  
 or thick brown paper: colour white, cinereous, or pale  
 yellowish.
- argentifer.* Flexible, brownish-red, in thin lamellar pieces, highly  
 charged with silver ore.  
*Lehmann phys. chem. Berlin,* 1761. 8. p. 116.  
 Found in the mines of *Hercynia, Carolina, and Dorothea.*

4. ACTINOTUS. Consisting of carbonate of  
 magnesia, a larger proportion of oxyde of iron,  
 and the greater part silica: harsh to the touch,  
 shining, rigid, fragile, parasitic, generally of a  
 green colour, spontaneously falling into granular  
 fragments, but breaking into indeterminate frag-  
 ments: melting in the fire, with ebullition, into  
 a pellucid 6-coloured globule,

- fibrosus.* Opake, soft, shining within, fibrous with the fibres di-  
 verging.  
*Hoffmann Bergm. journ.* 1789. 1. p. 163.  
 Found with pyrites in the mines of *Saxony*, of a glassy lustre,  
 sometimes greyish-white, greenish or reddish-white, or cine-  
 reous: feels a little greasy to the touch.

- vulgaris.* Shining, hardish, pellucid or diaphanous, radiate or striate.  
 Asbestoid. *Kirwan mineral.* 1. p. 166.  
 Radiated or striated *Shorl. Schmeisser,* 1. p. 206.  
 Actinote. *Thomson's chemistry,* 3. p. 596, 597.
1. With the rays parallel.
  2. With the rays divergent.
  3. With the rays fascicled.
  4. With the rays stellate.
  5. With the rays scattered.
  6. Pellucid, in 6 sided, elongated, compressed prisms.
- Found in the Iron mines of *Sweden*, the quarries of *Saxony*, and  
 the mountains of *Fraconia* and *Tyrol*, in long flattish 4 or 6-  
 sided crystals, which are brittle and not flexible: feels very  
 slightly, if any thing, greasy to the touch: colour greenish-  
 white or reddish-grey: it often constitutes the matrix of  
 metallic ores: contains silica 43. carbonate of lime 22.  
 iron 34.

*vitreus.*

Of a glassy lustre, semitransparent, hardish, somewhat fibrous.

2. In elongated 6-sided prisms, having the 2 opposite edges truncated.

Glassy Actinolite. *Kirwan mineral* 1. p. 168.

Vitreous striated hornl. *Schmeisser mineral* 1. p. 207.

Malacolite. *Thomson's chemistry*, 3. p. 597.

Found on the Island of Sky in *Scotland*, near Ailemont in *Dauphiné*, and in the *Tyrolese* mountains, in solid masses, and crystallized in 6-sided prisms: colour leek-green with a silvery lustre, or with a yellowish stain, or brownish red: it breaks longitudinally into long sharp splintery fragments, discovering its closely adhering quadrangular or hexangular fibres: contains silica 72, o. magnesia 12, 7. carbonate of lime 6, o. alumina 2, o. oxyde of iron 7, 3. *Bergman*.

5. HORNBLENDA. Consisting of carbonate of magnesia, an equal portion of oxyde of iron, and a nearly equal quantity of carbonate of lime: soft, opaque, generally of a dull colour, leaving a streak, lamellous, breaking into indeterminate fragments: melting in the fire, with ebullition, into a black opaque globule.

*vulgaris.*

With hardly any lustre, of a dull colour when broken in any direction, and exhibiting lamellar pieces or rays.

Talcum Corneus. *Syß, nat* xii. 3 p. 53 n. 9.

Hornblende. *Kirwan mineral* 1. p. 213.

Common Hornblende. *Schmeisser mineral* 1. p. 180.

Common Hornblende. *Thomson's chemistry*, 3 p. 542.

Found in *Sweden*, *Saxony*, *Portugal*, *Bohemia*, and most *European* mountains, In solid masses, interspersed with other stones; sometimes crystallized in 6 or 8-sided prisms: it is always either radiated or foliated, and the crystals are transversely striated: colour dull green or blackish: fracture straight, or curved, or divergingly striate: contains silica 37. alumina 27. iron 25. lime 5. magnesia 3. *Thomson*.

*labradorica*

Subopaque, with a little lustre, in curved lamellar pieces, which when broken discovers a coppery-black internal surface.

Labradore Hornblende. *Kirwan mineral* 1. p. 221.

Labradore Hornblende. *Schmeisser mineral* 1. p. 182.

## EARTHS. TALCOSE. 5. Hornblenda.

Found in scattered pieces in the Island *St. Paul*, on the *Labrador* coast: colour greyish-black, with sometimes a shade of coppery-red or iron grey, according to the direction of the light: fracture mostly curved and foliated.

*basaltina*. Shining, hardish, leaving a greyish-white streak, when broken longitudinally exhibiting straight lamellar pieces, crystallising into small 6 and 8-sided prisms terminated by 3 sided pyramids.

Basaltine. *Kirwan mine al.* 1. p. 219.

Basalt Hornblende. *Schmeisser mineral* 1. p. 183.

Basaltic Hornblende. *Thomson's chemistry*, 3. p. 543.

Found in Basalt, Tuffe, Wacke, and Lavas, in most parts of *Europe*, to which it adheres very closely: colour black, greenish-black, dark green, or yellowish green; of a shining surface when broken: melts before the blow-pipe int. a greyish enamel with a tinge of yellow: contains silica 58. alumina 27. iron 9. lime 4. magnesia 1. *Bergman*.



## ORDER II. PONDEROUS.

*Containing a larger portion of ponderous earth.*

6. BARYTES. Consisting almost entirely of ponderous earth: ponderous, parasitic, very brittle, harsh to the touch, soft: entirely soluble in boiling sulphuric acid, in the fire at first deprived of the cohesion of its parts, and afterwards melting without ebullition.

A. *Combined with carbonic acid gas, which does not totally disengage itself during liquefaction, and therefore effervesces with acids.*

*Witheringii.*

Of a common figure and equal texture.

Barolite. Witherite. *Kirwan mineral* 1. p. 134.

Carbonate of Baryt. *Schmeisser mineral* 1. p. 253.

Carbonat of Barytes. *Thomson's chemistry*, 3. p. 620.

Found at Anglezark near Chorley in *Lancashire*, near St. Asaph in *Wales*, and in *Argyleshire* in *Scotland*, in solid masses and crystallized: texture shining, radicated, fibrous: colour greenish-white or white: its crystals are small 6-sided prisms terminated by 6-sided pyramids: when heated it becomes opaque. Its powder phosphoresces when thrown on burning coals: contains barytes 62. carbonic acid 22, water 16.

*lamellosa.*

Lamellar, of a crystalline figure, semipellucid, smooth on the outer surface, shining within.

1. With 4 sided obliquangled facicled prisms.
2. With 6-sided prisms, terminated at both ends by a 6-sided pyramid.
3. With 4 sided obliquangled tables, the terminal margins obtuse with an acicular point.
4. With 6-sided double pyramids.

Carbonate of Barytes. *Sowerby Brit. minerals*, tab 76.

Found in *Scotland*, *Lancashire*, *Yorkshire*, and *Saxony*, in solid masses: colour white, with a degree of transparency.

B. *Saturated with sulphuric acid, and therefore not effervesces with acids: shining in the dark, after having been whitened in the fire.*

*terrestris.*

Friable, in an earthy loose or united form.

Baroliente in an earthy loose form. *Kirwan*, 1. p. 138.

Ponderous earth Cawk, or friable heavy Spar. *Schm.* 1. p. 255.

Earthy sulphat of Barytes. *Thomson's chem.* 3. p. 622.

Found in the lead mines of *Stafford* and *Derby*, near *Freyburg*, and in the vicinity of *Paris*, in coarse dusty particles, mostly forming small concretions, seldom in the form of powder: has an arid appearance, feels coarse, rough and harsh, and soils the fingers a little; colour snow-white, greyish, reddish or yellowish-white. it sometimes contains a little gypsum, silica, and lime.

*compacta*. Subopaque, shining, of a splintery fracture, with the fragments indeterminate and acutangled.

Compact Barofelenite. *Karwau mineral*. 1. p. 138.

Compact heavy Spar. *Schmeisser mineral*. 1. p. 256.

Compact sulphat of Barytes. *Thomson's chem.* 3. p. 622.

Found in the lead mines of *Derbyshire* and *Staffordshire*, and in *Saxony*, in amorphous or half rounded masses, or in nodules; breaking into sharp angular pieces, and when broken it has a dull appearance, with sometimes a little glittering: colour dull grey, yellowish-white or yellowish, cream-colour, pale flesh-colour, reddish, or bluish: contains sulphat of baryt 85,5. silica 6,7. felinite 2. water 2. specific gravity from 4,3. to 4,4.

*bononiensis*. Diaphanous, shining, somewhat fibrous, breaking into fragments more or less rhombic.

Maria phosphorea. *Syst. nat.* xii. 3. p. 99. n. 6.

Gypsum spathosum. *Will syst. min.* 1. p. 162.

Bononien stone. *Schmeisser mineral* 1. p. 261.

Bologna stone. *Thomson's chemistry*, 3. p. 623.

Found on the mountain Paterno near *Bologna*, detached, in roundish flat kidney form pieces, the fragments of which are obtusangled, roundish, with the superficies unequal: broken in a certain direction it appears fibrous, broken in another it appears rather lamellous: it sometimes falls to pieces spontaneously into granular fragments: colour smoke-grey, with a small degree of semitransparency: specific gravity from 4,440. to 4,496. contains by analysis sulphate of baryt 62,0. silica 16,0. alumina 14,75. gypsum 6,0. iron 0,25. water 2,0.

*lamellata*. Shining within, lamellar in a frondose manner, spontaneously falling into scaly fragments; the thicker scales cutting the plates under a right angle.

Lamellated heavy Spar. *Schmeisser mineral*. 1. p. 256.

Found in the mines of *Saxony* and *Transylvania*, in solid masses, sometimes in small lenticular crystals, sometimes clustered together in an oval kidney or spheroid form: colour white or cinereous, pale yellowish, brownish-red.

*vulgaris*. Lamellar, breaking into rhomboid fragments, falling spontaneously into convergent scales.

1. Of a common amorphous figure.
2. Crystallized in numerous forms and variations, the most usual of which are the quadrangular and hexangular prisms, the double quadrangular pyramid, the quadrangular table bevelled at the edges, the 8-sided plate, and the small rhomb with obtuse angles of  $105^{\circ}$ .

Crystallized sulphate of Barytes. *Sowerby Br. min. t. 70-1-2.*

Barofelenite. *Kirwan mineral. 1. p. 136.*

Sulphat of Barytes. *Thomson's chem. 3 p. 621.*

Common ponderous Spar, or Cawk. *Schmeiff. min. 1. p. 257.*

Found in various parts of *Britain* and *Europe*, and is the most common matrix of metallic ores: it is sometimes found in powder, often in amorphous masses, often crystallized: it is sometimes highly polished, generally diaphanous, and in its crystallized state transparent and reflective: colour snowy, silvery or blueish, greyish, greenish, reddish or yellowish-white, often flesh-colour, smoke colour, honey-colour, vinaceous, rarely olive-green, or greenish or yellowish-grey, or greyish-black, very rarely blue: the layers are generally straight, sometimes incurved: the primitive form of its crystals, according to *Haüy*, is a rectangular prism, whose bases are rhombs, with angles of  $101^{\circ} 30'$  and  $78^{\circ} 30'$ . specific gravity 4430. contains by analysis, pure barytes 67,2. sulphuric acid 32,8. *Withering.*

*stillatitia.* Of a rounded form, or coating other bodies.

Found on Mount *Iberg* in *Hercynia*, of a stalactitical origin and form, in other respects agreeing with *Barytes vulgaris*.

7. CROSSOPETRA. Consisting of ponderous earth, a larger portion of silica, and a smaller of alumina: lightish, hard, parasitic, meagre, crystalline: not totally soluble in sulphuric acid, even in a boiling heat, melting with difficulty in the fire.

*hercynica.* In 4 sided rectangular tables or prisms, transversely striate, terminating at one end in a needle point; two of them cutting each other crosswise and longitudinally.

*Heyer chem. annal. 1789. 1. p. 212.*

Found upon calcareous spar, in the mines of *Hercynia*, near *Andersburg*, in smaller aggregate crystals, sometimes very minute, rarely pellucid, oftener diaphanous or opaque: colour milk-white, hyaline, yellowish, not always striking fire with steel, yet frequently making a mark upon glass: melts with borax and soda, with ebullition.

*scotica.*

In 4-sided tables or prisms, one end running into a needle point, and not united.

Found in the mines of *Scotland*, near *Strontian*, and is distinguished by its larger crystals.

**8. STRONTIA.** Consists of strontian earth combined with acids: separates from a saturated solution in nitric acid, in the form of rhomboidal crystals: totally soluble in nitric and muriatic acids, with effervescence: does not melt in a strong heat, but discovers a bright phosphorescent light.

*carbonata.* Combined with carbonic acid.

Carbonate of Strontia. *Sowerby Brit. min. tab. 65.*

Stronthianite. *Kirwan miner. 1. p. 332.*

Strontionit. *Schweigger miner. 1. p. 263.*

Carbonat of Strontian. *Thomson chem. 3. p. 624.*

Found in the lead mine of *Strontian* in *Argyllshire*, in granite rocks, accompanied by Galena and Witherite, generally in amorphous masses, or in a state of crystallization: colour whitish-green: has some lustre, and a little transparency: when exposed to heat it does not crackle or split, but before the blow-pipe becomes white and opaque: with borax it effervesces and melts into a colourless transparent glass: it is soluble in 200 parts of water, at a temperature of 60 deg. its solution tinges flame red: its crystals are confusedly grouped, and more or less diverging from a centre, and are usually 6-sided prisms, terminated by 3-sided pyramids: specific gravity from 3,400. to 3,644. contains strontia 62. carbonic acid 30. water 8. *Pelletier.*

*sulphata.*

Combined with sulphuric acid.

Sulphat of Strontian. Celestine. *Thomson chem. 3. p. 624.*

1. Opaque, brittle, compact, somewhat splintery, in round pieces.

Earthy sulphat of Strontian. *Thomson chem. 3. p. 625.*

Found at *Montmartre* near *Paris*, of a blueish-grey colour, without lustre: specific gravity 3,5. contains sulphat of strontian 91, 42. carbonate of lime 8, 33. oxyde of iron 9, 25. *Vauquelin.*

2. Fibrous, with the fibres straight, somewhat transparent.

Fibrous sulphat of Strontian. *Thomson chem. 3. p. 625.*

Found in many parts of *Britain* and *Europe*, in masses: colour pale blue, reddish, or white: externally it has little or no lustre, internally shining: specific gravity 3,83.

3. Fibrous, with the fibres diverging, texture of the crystals straight foliated.

Foliated sulphat of Strontian. *Thomson chem.* 3. p. 625.

Found in *Britain* and *Sicily*, in masses and crystals: the amorphous pieces fibrous, with the fibres diverging: crystals grouped, shining, semitransparent: colour white.

9. SYDNEIA. Consists of ponderous earth, alumina, fine sand, and some colourlets mica: soluble in heated muriatic acid only; the solution not crystallizing, but becoming a butyraceous and deliquescent mass: melts in a heat of 15 deg. of wedgwood.

*australis.*

SYDNEIA.

Sydneia, or Sidney Earth. *Kirwan miner.* 1. p. 15.

Sydneia. *Wedgwood. Philos. Transf.* 1790. p. 306.

Australis Sidney Earth. *Schmeisser miner.* 1. p. 45.

Found in *Sydney Cove*, in *New South Wales*, white with sometimes a few black particles resembling black lead: the butyraceous mass from the solution is pale yellow and not corrosive.

## ORDER III. CALCAREOUS.

*Consisting principally of carbonate of lime.*

10. CRETA. Consisting of carbonate of lime and carbonic acid gas, and a few extraneous substances: friable, effervescing with and nearly totally soluble in acids: calcining in the fire, but not vitrifying in the strongest degree of heat.

*conchacea.* Containing small and very minute shells not cohering, not soiling the fingers, without lustre.

Calx conchacea. *Syst. nat.* xii. 3. p. 206.

Humus conchacea. *Crondst. min. sect.* 281. 1. b.

Humus animalis conchacea. *Wall. syst.* 1. p. 24. n. 8. b.

Found on the maritime parts of *Etruria*, *Saxony*, and *Wurtemberg*, rarely covered with mould.

*granulata.* Consisting of rounded quite glabrous milk-white opaque granulations, which do not stain the fingers.

Calx testacea, &c. *Syst. nat.* xii. 3. p. 208. n. 8.

Found on the shores of *Ascension Island*, where it serves as a nidus for the *Testudo Mydas* to lay its eggs in: it is composed of shells and corals comminuted by the waves of the sea, or of the harder calcareous substances worn down and rubbed together by the torrents of rivers.

*testacea.* Produced by comminuted shells, without lustre, not staining the fingers.

Calx testacea, &c. *Syst. nat.* xii. 3. p. 207. n. 4.

Found on the coasts of *England* and *France*.

*pulverulenta.* Reducible to dust, without lustre, rough to the touch, staining the fingers.

Native lime. *Sowerby Brit. min.* 1. tab. 1.

Native lime. *Kirwan min.* 1. p. 74, 75.

Found near *Bath*, white, without lustre or transparency, fracture earthy, and easily rubs to powder: when mixed with a little oxyde of iron it becomes yellowish.

*squamosa.* With somewhat greasy snow-white shining scales, which soil the fingers.

Agaric mineral var. 2. *Kirwan miner.* 1. p. 76.

Found near *Gera*: very friable, falling to dust in water, adheres to the tongue, and is entirely soluble in nitrous acid: colour sometimes silvery-white.

*farinacea.* Farinaceous, loosely cohering, floating, soiling the fingers.

*Calx solubilis purpurea.* *Syst. nat.* xii. 3. p. 206. n. 2.

*Agaric mineral.* var. 1. *Kirwan miner.* 1. p. 76.

Soft Carbonat of lime. var. 1. *Thomson chem.* 3. p. 608.

Found in *Britain* and various parts, in the clefts of rocks, or the bottom of lakes, or calcareous mountains; it is formed of more compact particles, is exceedingly brittle and reducible to dust, does not adhere to the tongue: colour white, reddish, or yellowish.

*scriptoria.* Solid, rough, slightly adhering to the tongue, without lustre, opaque, staining the fingers, breaking into indeterminate fragments.

*Calx creta.* *Syst. nat.* xii. 3. p. 206. n. 1.

*Chalk.* *Kirwan.* 1. p. 77. *Schmeisser.* 1. p. 214.

Soft Carbonat of lime. var. 2. *Thomson chem.* 3. p. 608.

Common chalk *Sowerby Brit. miner. tab.* 7.

Found in large strata in various parts of *Britain, Germany, France, and Sweden*, particularly on some sea coasts, often containing flints and the vestiges of echini and shells: colour generally white, rarely greyish: feels rather rough to the touch, and effervesces strongly with acids: contains carbonate of lime 95. alumina 2. water 3.

*Gasil.* Solid, hardish, brittle, a little shining and transparent.

Arenaceous limestone. *Kirwan miner.* 1. p. 78.

Found on the shores of *Rhagberry*, a small island on the coast of *Antrim*, and at *Codrilla*, on the west side of *Vesuvius*, yellowish-white. In the lump it cannot be easily broken, but in small pieces it fritters between the finger: phosphoresces when scraped in the dark with a knife: specific gravity 2.742. contains carbonic acid 47. *Kirwan.*

II. TOPHUS. Consisting principally of carbonate of lime: precipitated by water under water: porous, without lustre.

*communis.* Deposited at the bottom of cold waters running through mountains and calcareous strata.

*Syst. nat.* 1. p. 191. xii. 3. p. 183. n. 3.

*Stalactites calcareus.* *Walt syst. min.* 2. p. 389, n. 10?

*Stalact figura incerta.* *Cronst. miner. sect.* 12. 1. c.

Found in every part of the globe, sometimes hardening in the air, sometimes mouldering, of numerous varieties with respect to colour, and often forming the first material of calcareous strata.

*Ostrescella.* Calcareous, more or less cylindrical, perforated.

*Philosop. Transact.* 1745. p. 378.

*Syst. nat.* xii. 3. p. 189. n. 6.

*Stalactites calcareo arenosus.* *Wall. syst.* 2. p. 382. n. 6.

Found in various parts of *Germany*, and elsewhere, both in brooks and under beds of sand, from the size of a crow-quill to the thickness of a man's arm: white or ash colour, something in the shape of a bone, and was formerly supposed to have the quality of uniting broken bones. It is mostly in long cylindrical pieces, sometimes irregularly tubular and porous, sometimes filled up with a marly earth mixed with sand, with often the remains of decayed roots of trees in the centre. The incrustations do not appear in regular concentric layers, but consist of thin strata spirally rolled up: when first found in the earth, it is soft and ductile, but in a very short time it hardens by exposure to the air: consists of sand and earth cemented by a calcareous deposition.

*Incrustans.* Incrusting animal and vegetable substances with a calcareous coating and assuming their figure.

*Stalactites vegetab. incrust.* *Syst. nat.* xii. 3. p. 183. n. 1.

*Stalactites calcareus.* *Wall. syst. min.* 2. p. 380. n. 5.

*Stalactitic Tufa.* *Kirwan mineral.* 1. p. 180.

Found in various parts of *Sweden, Germany, Italy, &c.* clothing with a calcareous coat the smaller branches of trees, leaves, prickles, moss, plants, crabs, eggs, birds and their nests, preventing them from decay by defending them from the action of the atmospheric air. Most of those substances, which are commonly called petrifications, are of this species.

*Lebetum.* Incrusting the bottom and sides of vessels, in which water has been boiled.

*Tophus calcar. lebetum.* *Syst. nat.* xii. 3. p. 188. n. 12.

*Tophus fusibilis.* *Wall. syst. min.* 2. p. 392. n. 15.

Found on the bottom and round the sides of Tea-kettles, and other vessels in which water has been often boiled, forming a thin hard incrustation. It is formed in much greater quantities from spring than from rain water, and is seldom without a portion of silica.

*Dentium.* Forming incrustations on decayed teeth.

Found in scales, plates or irregularly shaped lumps on decaying teeth, and seems to be formed by deposition, in the same manner as the crust in tea-kettles. Its surface is very rough, and more or less porous.

*Thermalis.* Covering the bottom and sides of the receptacles and canals of warm baths.

*Tophus calcareus granulatus.* *Syst. nat.* xii. 3. p. 189. n. 13.



Found in the warm baths of *Hungary*, *Wisbadin*, and other places, often in such quantities as to fill up the canals and ducts; more frequently white than tinged with any other colour; is more or less compact, and sometimes so hard as to receive a fine polish.

*Cremor.*

Consisting of very thin diaphanous scales.

*Porus pulverulentus.* *Gerhard miner. p. 45. n. 1.*

Found principally in warm springs, containing calcareous earth, on the surface of which it floats like a pellicle.

*testaceus.*

Consisting of the aggregate fragments of shells.

1. Compact and harder.

*Testaceous Tufa.* *Kirawan miner. 1. p. 79.*

Found in the neighbourhood of *Syracuse*, *Palermo*, and the promontory of *Pasjoro* in *Sicily*: white or yellowish-white, exceeding porous and brittle, formed of various shells broken and compacted together.

2. Softer and not compact.

*Marly Tufa.* *Kirawan mineral. 1. p. 180.*

Found in most parts of *Europe*, yellowish-white, resembling mortar, without lustre or transparency, and very porous: fracture earthy.

12. SPATUM. Consisting of carbonate of lime, a larger proportion of carbonic acid gas, and water: lamellous, shining, parasitical, soft, lightish, breaking into rhomboidal fragments: crackling in the fire.

A. *Of a common figure.*

*spatum.*

Opake or nearly so.

*Spatum Solubile.* *Syst. nat. xii. 3. p. 49. n. 5.*

*Spatum rhomboidale.* *Wall. syst. min. 1. p. 137. n. 1.*

*Spatum calcareum.* *Cronst. min. sect. 10. 2. b.*

2. With the fragments irregular.

*Spatum calcarium.* *Syst. nat. xii. 3. p. 49. n. 7.*

3. With a variable lustre.

*Spatum fugax.* *Syst. nat. xii. 3. p. 49. n. 10.*

*Common Spar.* *Kirawan miner. 1. p. 86.*

*Calcareous Spar.* *Schmeissier min. 1. p. 220.*

*Calcareous Spar.* *Thomson chem. 3. p. 609.*

Found in *Norway*, *Sweden*, *Germany*, *Savitzerland*, and *Hungary*, most commonly white, sometimes cinereous, bluish, greenish, yellowish, red, or blackish. The variety 3) changes its lustre with respect to its position in the light.

*arenarium*. Diaphanous, with the foliations irregularly clustered.  
*Spatum confusum*. *Syst. nat.* xii. 3. p. 50. n. 9.  
*Spatum particulis dispersis*. *Wall. syst.* 1. p. 138. n. 3.  
 Found in *Sweden* and *Saxony*, white, grey; red, brown, or green,

*pellucidum*. Pellucid, hyaline.

*Spatum specular.* *Syst. nat.* xii. 3. p. 48. n. 1.  
*Spatum pellucidum*. *Wall. syst.* 1. p. 139. n. 4. a.  
*Spatum rhomboidale*. *Cronst. min. sect.* 19. 1. a. 2. 1.  
*Androdamas Plinii*, *Scheuchz. it. Alp* p. 324. 542.

2. Pellucid, tinged.

*Spatum solubile*. *Syst. nat.* xii. 3. p. 50. n. 6.  
*Spatum compactum*, *Mus. Tefs.* 16. n. 8.  
*Wall. syst. min.* 1. p. 139. n. 4. b, c, d, e.  
*Cronst. min. sect.* 10. 1. a. 2. 2.

3. Doubling the objects by refraction.

*Spatum solubile*. *Syst. nat.* xii. 3. p. 48. n. 2.  
*Spatum rhomboidale*. *Cronst. min. sect.* 10. n. 1. 2. 1.  
*Spatum informe molle*. *Carth. min.* 12.  
*Spatum pellucidum*. *Wall. syst. min.* 1. p. 140. n. 5.  
*Spatum alcalinum*. *Wolterfd. min.* 19.

Found in *Russia*, *Lapland*, *Norway*, *Sweden*, and other mountainous parts of *Europe*, the variety 3, which doubles the object by refraction, chiefly in *Iceland*: colour yellow or yellowish, olive, greenish, blueish, smoke-colour, blackish, rarely red or veined: when exposed to heat, it parts with its transparency and carbonic acid, and after calcination sometimes shines in the dark, if thrown upon hot coals.

### B. Of a peculiar figure.

*celulosum*. With the surface divided into cells.

Found in *Hungary* and *Hercynia*.

*stalactiticum*. Of a more or less cylindrical form.

2. Of a botryoidal figure, or resembling a bunch of grapes.

3. Of a shrubby appearance.

4. Resembling a branch of coral.

• Coral-form carbonate of lime. *Sowerby Br. min.* 1. 9.

Found in *Bohemia* and *Hungary*, the coralliform variety plentifully in the loose marl at *St. Marv's*, *Cornwall*, where it is used for manure, and in *North Wales*. Its appearance has so much the resemblance of a coral as to be commonly mistaken for such, but it appears on examination to be aggregations of calcareous earth ramifying in the soft marl: colour white, yellowish-white, or pale ferruginous from a small mixture of iron.

*globosum.*

Of 2 more or less globular form, compact.

Aetites marmoreus. *Syst. nat.* xii. 3. p. 179. 4.Pomum crystallinum. *Ad. Stockh.* 1740. *tab.* 2. f. 18.Spatum drusicum. *Cronst. miner. f&.* 11. b. 2.

2. Of a kidney-shaped form.

Found in the mines of *Hungary* and *Transylvania*, in *Switzerland* and *Sweden*, often consisting internally of prismatic crystals or pyramids convergent in a stellate manner.*inane.*

More or less globular, with the globules empty or hollow.

*V. Born. ind. f&.* 1. p. 9.Found in the mines called *Christiana* in *Hungary*.

## C. Crystallized.

\* *Obs.* The pyramidal crystals of Spar are distinguished from those of Quartz, by the angles of the pyramid never corresponding with those of the prism. *Ki. Dan.*

*brazeatum.* With 6-sided tables.Crystallized carbonate of lime. *Sowerby Brit. min.* 1. 2.Foliated and sparry limestone. *Kirwan min.* 1. p. 86.Calcareous spar. *Schmeisser miner.* 1. p. 220.Calcareous spar. *Thomson chem.* 3. p. 609.

2. With the tables more or less orbicular.

Crystallized carbonate of lime. *Sowerby Br. min. tab.* 12. 63.Crystallus subnitiformis. *Syst. nat.* xii. 3. p. 86. n. 5. g.*Amer. acad.* p. 479. *tab.* 10. *fig.* 18.

3. With the tables scattered.

*Sowerby Brit. miner.* 1. p. 31. *tab.* 13.

4. With the tables imbricate.

*Sowerby Brit. miner.* 1. p. 7. *tab.* 3.

5. With the faces of the rhomb in the inverse order of the laminæ of the nucleus.

*Sowerby Brit. miner.* 1. p. 9. *tab.* 4.

6. With the tables aggregate in series.

*Karsten Leske miner.* 1. p. 256.

7. With the tables aggregate in a rosular form.

8. With the tables aggregate in cells.

Spat. calcar. figurat. *Born. ind. f&.* 1. p. 8.

9. With the tables aggregate in a prismatic form.

Pearl spar. *Sowerby Brit. min.* 1. p. 45. *tab.* 19.Spat. crystal. lamel. *Born. ind. f&.* 2. p. 80.

10. With the tables aggregate in a pyramidal form.

Pearl spar. *Sowerby Brit. min.* 1. p. 45. *tab.* 19.*Karsten Leske miner.* 1. p. 256.

Found chiefly in limestone rocks in most parts of *Europe*: colour white, rarely yellowish, pale brown, reddish, green, very rarely crimson, blueish, purple or black: never quite opaque, but sometimes with a pearly lustre.

- cubicum*. With perfectly cubic aggregate crystals.  
 Spat. crystal cubic. *Wall. syst.* 1. p. 141. n. 6. a.  
 Pearl spar. *Sowerby Brit. miner.* 1. p. 45. t. 19.  
 Found in limestone rocks, generally white, sometimes with a pale rosy lustre, and clustered together in various shapes.
- rhombicum*. With aggregate cubic crystals, the faces of which are obliquangled.  
*Sowerby Brit. miner.* 1. p. 9. tab. 4.  
*Syst. nat.* 1. p. 164. n. 4. tab. 8. f. 13.  
*Amæn. acad.* 1. p. 481. tab. 16. fig. 12.  
*Gmel. syst. nat.* 3. p. 446. tab. 1. fig. 22.
2. Rhombic, with 2 opposite obtuse margins truncate,  
*Karsten Leske miner.* 1. p. 260.
  3. Rhombic, with the faces convex.  
*Karsten Leske miner.* 1. p. 259.  
 Found in many mines of *Europe*, among limestone rock, and is generally white, or reddish from a mixture of iron.
- triedrum*. With 3-sided prisms, terminated by a 3-sided pyramid.  
 Porus prismaticus. *Gerb. mineral.* p. 47.
- tetraedrum*. With 4-sided prisms.  
*Born. ind. foss.* 1. p. 6. 8. 2. p. 78.
2. Prismatic, with the alternate faces narrower.
  3. With the surface rugged.
  4. Prismatic, with the terminal faces running into an acicular point.
  5. The prisms terminated at each end by a 3-sided pyramid:  
 Found in the mines of *Scotland* near *Strontian*, in *Silesia*, *Hungary*, *Saxony*, and other places, sometimes opaque, sometimes pellucid, frequently white, rarely reddish or greenish.
- prismaticum* With perfectly 6-sided prisms.  
*Gmel. syst. nat.* 3. p. 445. tab. 1. f. 5.  
 Nitrum truncatum. *Syst. nat.* xii. 3. p. 86. n. 5.  
 Crystallus subnitriiform. *Amæn. acad.* 1. p. 497. t. 16. f. 16.  
 Spatum crystallizatum. *Wall. min.* 58. f. 5.
2. Prismatic, with the terminal faces convex.
  3. With the terminal faces ending in an acicular point.
  4. Prismatic, with the alternate faces narrower.  
*Gmel. syst. nat.* 3. p. 445. tab. 1. fig. 6.  
 Crystallus subnitriiformis. *Amæn. acad.* 1. p. 479.

5. Prismatic, with the 2 opposite faces far exceeding the rest.
6. Emitting a phosphorescent light when burnt.

Found in *Derbyshire, Hercynia, Saxony, Silesia, Hungary, and Spain*, in mines: generally white, and frequently transparent: commonly aggregate, scattered, or in regular series.

*Dodecaedron* With 6-sided prisms, terminated at each end by a 3-sided pyramid.

*Gmel. syst. nat.* 3. p. 445. tab. 1. fig. 11.

*Natrum lapidosum.* *Syst. nat.* xii. 3. p. 91. n. 11.

*Nitrum spatiosum.* *Mus. Teshin.* 26. tab. 2. f. 5.

*Spatum crystallizatum.* *Wall. syst.* 1. p. 143. n. 6. 1.

2. Pyramidal, with the margins truncate.

3. Pyramidal, with the tips truncate.

*Natrum 14-edrum.* *Syst. nat.* xii. 3. p. 86. n. 6.

*Crytal. subnitriform.* *Amœn acad.* 1. p. 479. t. 16. f. 17.

*Spat. cryst. tetradecaed.* *Wall. syst.* 1. 143. n. 6. k.

4. Pyramidal, with the faces convex.

5. With a very short prism.

*Born. ind. foss.* 1. p. 5. tab. 1. fig. 2.

6. With the crystals aggregate in a globular form.

*Tophus spatiosus.* *Syst. nat.* xii. 3. p. 191. n. 19.

*Spatum orbiculatum.* *Mus. Tesh.* 14. n. 1.

Found in the mines of *Derbyshire, Germany, Saxony, Hungary, &c.* generally pellucid, rarely yellowish or greenish, most commonly white, with the pyramids sometimes depressed; the crystals sometimes thinner, sometimes thicker, frequently in pairs cutting each other at right angles, or clustered in regular series, or in fascicles or bundles, or in a globular olive or pyramidal form.

*Endodecaedron.* With 6-sided prisms, terminated at each end by a 6-sided pyramid.

2. With 6-sided prisms, terminated above with a 6-sided pyramid; the margins of the pyramid incurved towards the prism.

*Freber 3 Briefe.* p. 50.

3. With 6-sided prisms, terminated by a 6-sided pyramid, inversely opposite to itself in the middle part.

*Freber 3 Briefe.* p. 59.

Found in the mines of *Derbyshire and Cumberland*, and in *Hercynia*, white or yellowish; the terminal pyramid sometimes augmented by another 5-sided pyramid.

*Hyodon.* With a double 6-sided pyramid.

*Dog's tooth spar.* *Sowerby Brit. min.* tab. 33, 34, 35.

*Natrum lapidosum.* *Syst. nat.* xii. 3. p. 92. n. 13.

Cryſtallus ſubnitriſorm. *Amæn acad.* 1. p. 480. 22.

Nitrum irregulare. *Muf. Teſ.* 26. n. 1. tab. 2. f. 7.

Spathum cryſtallizatum. *Wall. ſyſt.* 1. p. 141. n. 6. c.

Cryſtalli ſpatofi. *Cronſt. min. ſeſſ.* 11. 1. b. 1.

*Gmel. ſyſt. nat.* 3. p. 447. tab. 1. f. 31.

2. With the pyramids hollow and empty.
3. Each pyramid augmented by another 3-sided pyramid.
4. With the margins of the pyramids obtuſe.
5. With one of the pyramids longer.

Cryſtallus nitriſormis. *Amæn. acad.* 1. p. 477. t. 16. f. 9, 10.

6. With the cryſtals cluſtered in bundles.

Found in the mines of *Derbyſhire* and *Cumberland*, in *Sweden*, *Hungary* and *Germany*: more frequently white than yellowiſh or with a tinge of green: ſometimes pellucid, ſometimes opaque: the cryſtals frequently very ſmall, rarely tranſverſely grooved, and often placed in a regular ſeries.

hexangula-  
re.

With a ſingle 6-sided pyramid.

Spat. cryſtal. hexang. *Wall ſyſt. min.* 1. p. 141. n. 6. b.

2. The pyramid augmented at the top with an additional 3-sided pyramid.
3. With the cryſtals ſurrounding other bodies in the form of prickles.

*Waller ſyſt. min.* 1. p. 142. n. 6. d.

Found in the mines of *Sweden*, *Hercynia*, *Germany*, *Saxony*, and *Hungary*: the cryſtals larger or ſmaller, broader or narrower, ſometimes capillary, rarely inveſted, often cutting each other at right angles, or cluſtered together in the form of faſcicles, ſtars, bundles, ſheafs of corn, ſhrubs or double 6-sided pyramids.

pentædram.

With a ſimple 5-sided pyramid.

Spat. calcar. cryſtal. *Born. ind. ſoff.* 1. p. 6.

Found in *Hercynia*, white, tranſparent, aggregate,

pentagonum

With a double 5-sided pyramid.

*Born. ind. ſoff.* 1. p. 6, 7.

Found in *Hungary*, in the country of the Tyroleſe, ſometimes opaque, ſometimes pellucid, generally white, rarely with a roſaceous tinge: the cryſtals are ſometimes empty, with the faces unequal.

pyramidale.

With a double 3-sided pyramid.

*Born ind. ſoff.* 1. p. 5, 6 2. p. 78.

2. With the angles of the common baſe truncate.  
*Karſten Leſke mineral.* 1. p. 258.
3. With the cryſtals empty.  
*Karſten Leſke mineral.* 1. p. 262.

Found in the mines of *Scotland, England, Hercynia, Saxony, Germany, Hungary*, and other places, opaque or transparent, more commonly white than cinereous or any other colour, sometimes one, sometimes both of the pyramids elongated and acute, rarely diagonally striate; the crystals generally minute, disposed in series or cells, or in a rosular, globular or granular form.

*irigonum.*

With a single 3-sided pyramid.

Natrum urinolum. *Syst. nat.* xii. 3. p. 92. n. 12.

Spat. crystal. triangul. *Wall. syst. min.* 1. p. 142. n. 6. 9.

*Gmel. syst. nat.* 3. p. 447. tab. 1. f. 37.

2. With the pyramids empty.
3. The angles of the base of the pyramid truncate,
4. With the pyramids excavated at top.
5. With the pyramid augmented at the top with another pyramid.
6. With the crystals clustered in an imbricate manner.

Cryst. subnitr. spatof. *Amæn. acad.* 1. p. 478. t. 16. f. 14.

Found in the mines of *Derbyshire, Salberg in Sweden, Germany, Saxony, Hungary, &c.* opaque or transparent, most commonly white, rarely brownish or yellowish, very rarely olivaceous: the crystals most frequently minute, broader or narrower, sometimes capillary, longer or shorter, often depressed, clustered scatteringly or in an imbricate manner, or in a kidney or granular form.

*lenticulare.*

With the crystals appearing in a lenticular form.

Natrum lentic. acaulon *Mus. Test.* 28 tab. 2 f. 1.

Found in the mines of *Hercynia, Thuringia, Saxony, and Bohemia*, most frequently white, often pellucid, or with a milk-white nucleus shining through a transparent coating: the crystals sometimes hollow, frequently 6-sided, sometimes incurved like the beak of an ancient saddle, often disposed scatteredly in cells or in a rosular form or that of spherical granulations.

*granatinum*

With 12 sides consisting of pentangles.

Porus granaticus. *Gerb. mineral.* p. 49. n. 12.

Found in the mines of *England, Germany, Saxony, Hungary, &c.* generally white, rarely yellowish. Is probably only a variety of Sp. cubicum or Sp. dodecaedrum.

13. **SCHISTOSPATUM.** Consisting of carbonate of lime, a larger proportion of carbonic acid gas, and water: effervescing with acids: lamellar, with the foliations curved, parasitical, soft, breaking into indeterminate fragments, lightish, a little greasy to the touch: crackling in the fire.

*fissile.*

**SCHISTOSPATUM.**

1. With the fibres curved.  
 Spatum solubile. *Syst. nat.* xii. 3. p. 48. n. 3.  
 Spatum lamellosum. *Wall. syst.* 1. p. 138. n. 2.  
 Spatum lamellosum. *Cronst. min. syst.* 101. 2.  
 Plated spar. *Schmeisser mineral.* 1. p. 225.  
 Argentine. *Kirwan mineral.* 1. p. 104.  
 Schieferspar. *Thomf. chemist.* 3. p. 610.
2. With the fibres undulate.  
 Spatum undatum. *Syst. nat.* xii. 3. p. 49. n. 4.

Found near *Schwarzenburg* and *Königsburg* in *Saxony*, and in the spara pit in *Norway*; 2) near *Kopmannesfel* in *Sweden*, in irregular masses and very brittle: colour greyish, reddish or greenish-white, with a silvery greasy lustre, or similar to mother of pearl; sometimes opaque or nearly so, rarely diaphanous, may be scratched with the nail: when heated to redness it turns reddish-brown, and at a degree of 155 is converted partly into a brown porcelain mass, partly into a reddish-brown glass. Mr. *Kirwan* supposes it to contain carbonate of lime, silica, and oxyde of iron.

14. **INOLITHUS.** Consisting of carbonate of lime, carbonic acid gas, and a little iron: entirely soluble in nitric acid with effervescence: fibrous, parasitic, soft, lightish, breaking into indeterminate fragments.

*filamentosus* With the fibres parallel.

- Styrium marmoreum.* *Syst. nat.* xii. 3. p. 47. n. 2.  
*Alabastrites.* *Itt Scav.* 121.  
*Calcar. figurat. filament.* *Wall. syst.* 1. p. 127. n. 6. a.  
 Fibrous limestone. Alabaster. *Kirwan.* 1. p. 88.  
 Tofus. *Schmeisser mineral.* 1. p. 218.

2. With the fibres transverse.  
*Stalactites stiriaceus.* *Syst. nat.* xii. 3. p. 184. n. 8.



## 3. With a rich satiny lustre.

Satin spar. *Sowerby Brit. mineral.* 1. p. 11. t. 5.Satin spar. *Pepys Philos. mag.* xii. p. 365.

Found in *Russia, Poland, Germany, Saxony, and Bohemia*, with the fibres straight or a little curved: the satin spar is found about a mile from *Alston* in *Cumberland*, washed by the river *Tyne*, near the level of its bed; colour white with sometimes a rosy tinge from a diluted mixture of oxyde of iron, and transmits light from the edges or in thinner pieces: fracture in the direction of the striæ fibrous, straight or curved: specific gravity from 2,709. to 2,721. contains carbonic acid 47,600. carbonate of lime 50,080. water of crystallization 02,308. and sometimes iron 00,012. *Pepys.*

*acerosus.* With the fibres fascicled.*Gerb. mineral.* p. 53. n. 3.Found at *Schemnitz* in *Hungary*, white or yellowish, yellow, yellow-brown, or flesh-colour.*stellaris.* With the fibres diverging in a stellate manner, of a common figure.*Inolithus radians.* *Gerb. mineral.* p. 52. n. 2.Found in calcareous mountains in *Germany*, and in the mines of *Bohemia* and *Hungary*, white, sometimes yellowish or cinereous.*flos ferri.* Ramulous, with the fibres diverging in a stellate manner.*Stalactites marmoreus.* *Syst. nat.* xii. 3. p. 183. n. 4.*Ferrum mineral. ramos.* *Carth. min.* 71.*Stalagmites coralloides.* *Wall. syst.* 2. p. 388. n. 9. d.Found in the iron mines of *Heidenheim* in *Wurtemberg*, in *Styermarch*, *Carinthia* and *Hungary*, sometimes mixed with iron, but more frequently upon iron-stone: generally inowy, sometimes yellowish.

## 15. STALACTITES. Consisting of carbonate of lime, carbonic acid, and water: formed in the air, by the gradual deposition of water: diaphanous, without lustre internally, breaking into indeterminate fragments, and separating into concentric crusts: found chiefly on the roofs and sides of arches, and the caverns of calcareous mountains.

*spatosus.* Pendulous, lamellar internally, diaphanous.*Lime Stalactite.* *Sowerby Brit. min.* p. 13. tab. 6.*Stalactites marmorea.* *Syst. nat.* xii. 3. p. 184. n. 7.

Found in various caves of limestone rocks in *Britain, Germany,* and other places, white, cinereous, brownish, or yellowish, and of various shapes.

*Stiria.*

Pendulous, in contric crusts.

Lime Stalactites. *Sowerby Brit. min. p. 13. t. 6.*

Stalactites calcareus. *Wall. syst. min. 2. p. 386. n. 8.*

Stalactite. *Kirivau. mineral. 1. p. 88.*

Fibrous limestone. *Thomson chemistry, 3. p. 609.*

Stalactitical limestone. *Schmeisser mineral. 1. p. 218.*

1. Cylindrical,

a. Empty or fistulous.

b. Solid.

c. Priapolithus. *Marcorelle Aët. Paris. peregr. 7. n. 4.*

d. Callites. Phalloides. *Wall. syst. 2. p. 601. n. 1. f.*

e. Fungiform. *Wall. syst. 2. p. 388. n. 9. c.*

2. Conic,

a. Empty or fistulous.

Tophus turbinatus. *Syst. nat. xii. 3. p. 190. n. 18.*

b. Perforated at top. *Syst. nat. xii. 3. p. 183. n. 2.*

c. Solid.

3. More or less cylindrical and compressed, resembling the  
roofs of

a Zedoary.

Florentine Iris.

Ginger: *Zingiberites.*

Found hanging down from the arches of bridges, and the roofs and sides of caverns and cellars of limestone, and is formed by the gradual deposition and evaporation of water, impregnated with lime, which has been more or less inspissated and hardened in the air: colour white, grey, brown, or yellowish, opaque or transparent.

*Stalagmites* Sessile, with spherical faces.

Stalact. calcar. fig. glob. *Wall. syst. 2. p. 387. n. 9.*

1. Globular.

a. With the globules distinct.

b. With the globules joined in pairs.

Orchiti. *Wall. syst. min. 2. p. 601. n. 1. g.*

2. Nodulous.

3. Kidney-form.

4. Mamillary.

5. Carpoliths.

6. Resembling a Cauliflower.

7. Chiriti.

8. Sceliti.

Found in various calcareous caves and mines.

*solidus.*

Sessile, solid.

*Syst. nat.* xii. 3. p. 183. n. 3.

Found in the caves of *Adrianople* and other places, diaphanous, admitting a polish, appearing a little greasy, milk-white, with red, rosy, yellow, brown or cinereous veins, stripes or spots, sometimes cinereous, red, yellow, brown, rarely blue.

16. PISOLITHUS. Consisting of carbonate of lime, a very small proportion of sand and oxyde of iron, carbonic acid gas, and water: soft, opaque, without lustre internally, breaking into indeterminate fragments, and separating into spherical granulations: of a centrically lamellar texture: found about warm springs.

*carolinus.*

PISOLITHUS.

*Tophus oolithus.* *Syst. nat.* xii. 3. p. 189. n. 14.

*Oolithus.* *Wall. fyt.* 2. p. 384. n. 7. 4.

*Pisa carolina.* *Worm. Mus.* 52.

*Oolite and Pisolite.* *Schmeisser mineral.* 1. p. 219.

*Compact limestone, var. 3.* *Kirwan miner.* 1. p. 82.

*Pisolite.* *Thomson chemistry,* 3. p. 610.

Found near the warm springs of *Carlsbad* in *Bohemia*, in *Silesia* and *Hungary*, in the form of round masses composed of concentric layers, each containing a grain of sand in its centre: colour white or yellowish-white, brownish, reddish or yellowish.

17. MARMOR. Consisting of carbonate of lime, carbonic acid gas, and water: hardish, meagre to the touch, of a common form, lightish, composing whole mountains or the greater part of them, or in detached pieces: burning into quicklime, soluble for the greater part in acids, with effervescence.

*Hammites.* Opaque, without lustre, compact, consisting of accreted round granulations.

*Marmor granis globulis.* *Syst. nat.* xii. 3. p. 43. n. 12.

*Ketten stone.* *Sorverby Brit. m.n.* p. 17. tab. 8.

*Compact limestone.* *Kirwan mineral.* 1. p. 82.

*Oolithus.* *It. Gall.* 266.

*Pisolithus.* *Vogel mineral.* 256.

Stalact. calcar. glob. *Wall. syst.* 2. p. 383. n. 7.

Oolithus. *Schmeißer mineral.* 1. p. 216.

2. Oolithus. With the globules as large as the spawn of a fish.
3. Cenchrites. With the globules as large as a millet seed.
4. Meconites. With the globules as large as the seeds of the poppy.

Found in stratified mountains in various parts of *Britain*, particularly at *Ketton* in *Rutlandshire*, and at *Bath*, in *Saxony*, *Brunswick*, *France*, *Switzerland*, &c. always in large masses, with rarely the remains of animal substances: colour dull grey, brownish or yellowish, with sometimes a mixture of the two first colours: the granulations are easily detached, and in small pieces may be crumbled between the fingers. What is usually called *Bath stone* and *Portland stone* are varieties of this species.

*granulare.* Nearly opaque, lamellar, shining internally, hardish, spontaneously falling into granulations, not admitting a polish.

Marmor rude. *Syst. nat.* xii. 3. p. 41. n. 6.

Calcareus gran. dens. *Wall. syst.* 1. p. 122. n. 2.

Foliated and granular limestone. *Kirwan miner.* 1. p. 84.

Granularly foliated limestone. *Thomson chem.* 3. p. 609.

Found in vast beds or strata in many mountains of *Europe*, &c. constituting their principal parts, and never containing the vestiges of living bodies: the granulations of different sizes: colour white, cinereous, black, brown, red, yellowish or variegated: fracture foliated, often small and fine, always straight: it is used for building, mending roads, burning into lime, and as a flux for iron-stone.

*micans.* Diaphanous, white, lamellar, shining internally, hardish, spontaneously falling into finer granulations, receiving a polish.

Marmor part. spatoso-squam. *Syst. nat.* xii. 3. p. 42. n. 7.

*Wall. syst. min.* 1. p. 124. n. 4. a. p. 120. n. 8. a.

Parian and Carrara marble. *Kirwan miner.* 1. p. 85.

Granular limestone. *Schmeißer miner.* 1. p. 217.

Carrara and Paros marble. *Thomson chem.* 3. p. 609.

2. Marmor tardum. *Syst. nat.* xii. 3. p. 41. n. 5.  
With subimpalpable particles, white, diaphanous.
3. Marmor decussatum. *Syst. nat.* xii. 3. p. 42. n. 8.  
With oblong depressed decussately scattered particles.
4. Marmor acerosum. *Syst. nat.* xii. 3. p. 42. n. 9.  
With oblong acerosely longitudinally scattered particles.
5. Pietra elastica. *Freber Brief. and Wolschland.* p. 110.

Found in ancient primitive mountains, in vast strata, and with rarely the vestiges of animal bodies, in *Finland*, *Saxony*, *Sweden*, *Bohemia*, near *Carrara*, in the islands *Paros* and *Antiparos*, and most mountainous countries, and is frequently the material of ancient buildings: sometimes it contains a portion of quartz, so that it effervesces slowly with acids, and strikes fire with steel: when broken it is a little shining, and has a lamellar grained texture.

*phosphoreum.* Compact, diaphanous, snowy, emitting light in the dark when rubbed together.

*Crayton Cat. Miner. Coll. Nazarr. Rom. 1. p. 156, 157.*

Found in primitive strata in the mountains *Jesuvius* and *Ottajano*, and nearly dissolves in nitric acid with a strong effervescence. If rubbed together in the dark, or thrown in the form of powder upon heated iron, it emits a phosphorescent light.

*Dolomiaci.* Effervescing slowly with acids, covering itself with a vitreous coating in the fire.

*Saussure Journ. Phys. 1792. 1. p. 161.*

*Dolomite. Kirawan miner. 1. p. 111.*

*Dolomite. Thomson chemistry, 3. p. 609.*

Found in the *Tyrolische* mountains, with hardly any lustre or transparency, and breaking into convex fragments, does not moulder by exposure to the atmospheric air: contains carbonate of lime 4,429. alumina 0,586. magnesia 1,4. iron 0,074. carbonic acid gas 4,61.

*elasticum.* Elastic, yellowish-white, emitting a phosphorescent light when thrown on red hot iron.

*Fleurian. Journ. Phys. 1792*

Elastic marble. *Kirawan mineral. 1. p. 113.*

Found on Mount *Gothard* in *Switzerland*, in large masses: surface rough and uneven; slightly flexible and evidently elastic when its length exceeds 11 or 12 times its thickness: effervesces and dissolves very slowly with acids: contains carbonate of lime 0,322. alumina and iron 0,175. mica 0,003. magnesia 0,035 carbonic acid gas 4,638.

*squamosum.* Granular, compact, scaly.

Lap. calcar. part. squam. *Cronst. min. sect. 9. 1.*

Schuphichte Kaikitt. in. *Noße o th. Br. Sieb. 2. p. 4.*

Found in *Grapenburg*, *Finland*, and *Sweden*, constituting the principal part of simple mountains, and containing no vestiges of living bodies: colour white, or reddish-yellow: produces an indifferent quicklime.

*porosum.*

Perforated with pores, without lustre, opaque, not receiving a polish. *Filtering stone.*

1. Marmor filtrum. *Gerb. mineral. p. 40. n. 5.*

Perforated with pores, distilling water.

Found in the quarries of *Rudersdorf* in Germany.

2. Spongy. *Essai de mineral. des monts pyren.*

Found in the *Pyrenees*, and province of *Bearne*.

3. Hollow and appearing rotten.

*Born. ind. foss. 2. p. 77.*

Found near *Idria* in *Carniola*.

4. Cellular. *Born. ind. foss. 2. p. 77.*

Found in *Alsace*, and the vast mountains of *Bohemia*: the pores are formed by pyrites formerly imbedded in it, but which has mouldered away and been washed out.

*margodes.*

Compact, without lustre, subopaque, not receiving a polish, with the fragments convex.

Marmor fissile. *Syst. nat. xii. 3. p. 41. n. 4.*

Margodes. *Wall. syst. min. 1. p. 353. n. 3.*

Calcareous marl. *Kirwan. mineral. 1. p. 94, 95.*

Carbonat of lime and clay. *Thomson chem. 3. p. 611.*

Found in stratarial mountains of *Bavaria*, *Frankfort*, *Sweden*, &c. mixed with a greater or less proportion of clay, and often marked with diaphanous veins in the form of shrubs, with frequently the vestiges of fishes and crabs, rarely shells or such animals as inhabit salt water: colour yellowish or reddish-white.

*stratarium.* Mixed with clay, in water falling into powder, crackling in the fire, consisting of horizontal strata.

Marmor part. argill. *Syst. nat. xii. 3. p. 42. n. 10.*

Alwarsten. *It. Oel. 51. It. Scan. 107.*

Found in *Oeland*, *Scania*, and the mountain *Kinneulle* in *Sweden*, breaking into horizontal and perpendicular strata, and abounding in petrifications; the upper strata are much harder than the lower.

*florentinum.* Mixed with argil, opaque, compact, receiving a polish, curiously depicted.

Marmor partic. impalp. *Syst. nat. xii. 3. p. 41. n. 3.*

Marmor pictorius. *Wall. syst. min. 1. p. 133. n. 10. a.*

Marmor florentinum. *Lang. lap. fig. 33.*

Found in *Italy* and Mount *Sinai*, yellowish-grey with generally brown pictured marks of various forms.

*obile.*

Subopaque, compact, of a splintery fracture, receiving a high polish, and of a fine colour.

Marmor solubile. *Syst. nat. xii. 3. p. 40. n. 2.*

Marmor. *Wall. syst. min. 1. p. 129, &c. n. 8, 9.*

Carbonat of lime. *Thomson chem.* 3. p. 607.

Marbles. *Schmeisser mineral.* 1. p. 244.

1. Of one uniform colour.

Rufous. *Numidian.*

Flesh-colour.

Red.

Cinnam n. *Marmo canello.*

Yellow. *Phengites.*

Pale yellow. *Polombino antico.*

Grey. *Bardillio. Venetian.*

Blue. *Of Chios and Narbon.*

Green. *Verdello.*

Livid. *Pardalar.*

2. Variegated. *Sowerby Brit. mineral.* 1. tab. 79.

With bands.

striae.

lines. *Marmo scritto.*

veins.

the colours gradually running into each other.

spotted. *Brocatello.*

ocellated. *Occhio di parone.*

dotted.

powdered. *Marmo polveroso.*

White. *African.*

Black. *Canary.*

Yellow. *Porta santa.*

Purplish. *Lesbian.*

Green. *Lacedemonian.*

Forms stratified mountains in almost every part of the globe, exhibiting innumerable varieties of colour and depiction: it is more or less loaded with petrifications, particularly of the testaceous kind; burns into very good lime, and is chiefly used in sculpture and costly buildings.

*vulgatum.* Subopake, compact, of a splintery fracture, receiving an indifferent if any polish, and of a viler colour.

Calcareus solidus. *Waller syst. min.* 1. p. 119. n. 1.

Compact limestone. *Kirwan mineral.* 1. p. 80. 82.

Compact limestone. *Thomson chem.* 3. p. 608.

Common limestone. *Schmeisser mineral.* 1. p. 215.

Found in vast mountainous masses, sometimes in rounded lumps, as at *Aberthaw* in *Glamorganshire*, sometimes on the beach in the form of shingles: colour greyish, blueish, blackish, sometimes cream-colour, flesh colour or yellowish, often with several colours mixed: differs from the marbles only in colour and polish, and is the material every where used for burning into lime.

*fissile.*

Opake, compact, composed of thinner strata.

Schistus effervescens. *Syst. nat.* xii. 3. p. 39. n. 12.Compact limestone, var. 4. *Kirwan mineral.* 1. p. 83.Found in various parts of *Britain*, *Sweden*, and on Mount *Calpe* near *Gibraltar*, blue, grey, or brown, sometimes of two colours with alternate white, reddish-brown, grey, black, or greenish layers.

18. **SUILIUS.** Consisting of carbonate of lime, carbonic acid, sulphurated hydrogen, and water: when scraped or rubbed emits an urinous or garlicky smell: soluble almost entirely in acids, with effervescence: burning into quicklime.

*marmoris.* Opake, compact, black, receiving a fine polish, with the fragments more or less convex.

Bitumen marmoreum. *Syst. nat.* xii. 3. p. 111. n. 9.Marmor nigrum. *Wall. syst. min.* 1. p. 130. n. 8. b.Swine stone. *Kirwan mineral.* 1. p. 89.Swine stone. *Schmeißer mineral.* 1. p. 231.Swine stone. *Thomson chem.* 3. p. 613.Found in the stratified mountains of *Sweden*, *Belgium*, *Franconia*, *Bohemia* and *Silesia*, often abounding in petrified bodies, breaking into indeterminate fragments, and without internal lustre.*schistosis.*

Opake, compact, fissile, with flat fragments.

Marmor schistosum. *Syst. nat.* xii. 3. p. 40. n. 1.Flinten. *It. Scan.* 121. 143. 148. 156.Sowerby *Brit. miner. tab.* 21. lower figure.Found in the stratified mountains of *Britain*, *Sweden*, *Silesia*, and other parts of *Europe*, frequently among coal, with often the impressions of plants and fishes: colour black, yellowish-brown, cinereous, or dark grey.*lamellosus.*

Of a lamellar texture.

Spatum frictione foetid. *Wall. syst. min.* 1. p. 147. n. 7. a.Dytodes (spathosus). *Gerb. miner.* p. 54. n. 3.Found in the calcareous mountains of *Sweden* and *Thuringia*, parasitical, black or brown, rarely yellowish, the foliations larger or smaller.*botryoides.*

In hollow globules, crystallized within, and connected like a bunch of grapes.

Marmor part. argill. *Syst. nat.* xii. 3. p. 43. n. 11.Görsten. *It. Wgoth.* 21. 28.Marmor strumosum. *Gmel. syst. nat.* 3. p. 108. n. 12.Botryoidal limestone. *Sowerby Brit. min.* 1. p. 81. tab. 38.



Found in various parts of *Britain* and in *Sweden*, and seems formed by calcareous water passing through loose marly earth: the globules are smaller or larger, and occasionally a little hollow and crystallized within: colour yellowish, occasioned by oxyde of iron with more or less clay.

*crystallinus*. Crystallized in elongated 6-sided pyramids.

Bitumen fuill. cryst. *Syst. nat.* xii. 3. p. 11. n. 9. E.

Nitrum fuillum. *Syst. nat.* xii. 3. p. 86. n. 8.

Lap. fuill. prism. *Wall. syst. min.* 1. p. 144. n. 7. b.

2. With the crystals diverging.

Lap. fuill. radiat. *Wall. syst. min.* 1. p. 144. n. 7. c.

3. With the crystals spherically clustered.

Lap. fuill. sphæric. *Wall. syst. min.* 1. p. 144. n. 7. d.

Found under the common soil in *Sweden*, *Westrogoth* and *Oeland*.

19. TREMOLITES. Consisting of carbonate of lime, a larger proportion of silica, a little carbonate of magnesia, water and carbonic acid gas: radiate, hardish, shining, brittle, emitting a phosphorescent light in the dark when struck or rubbed: partly soluble in nitric acid, with effervescence.

*Hoefneri*. TREMOLITES.

*Freber Briefe mineral. Inhalts.* p. 22.

Siliciferous Marlite. *Kirwan mineral.* 1. p. 101.

Tremolit. *Schmeisser mineral.* 1. p. 208.

Tremolite. *Thomson chem.* 3. p. 601.

Grammatite. *Haüy.* 3. p. 207.

Found in Mount *Tremola* near *St. Gothards*, in *Switzerland*, white, reddish, greenish, yellowish or greyish; sometimes amorphous, sometimes in crystals, the crystals longitudinally striate: contains silica 65,0. lime 38,0. magnesia 0,5. oxyde of iron 0,5. water and carbonic acid 6,0.

20. STELLARIS. Consisting of carbonate of lime, a smaller proportion of silica, and a little water and oxyde of iron: fibrous in a stellate manner, of a silky lustre, soft, parasitical: easily melting in the fire, with ebullition: partly soluble in nitric acid, with effervescence.

*Transylvanica*. STELLARIS.

*Fitch et Bindheim. Schrift. Berl Naturf.* p. 442.

Found near *Unterkelesch* in *Transylvania*, in the harder kind of *Marmor micar* white or sea-green. *Gmelin* suspects it may be a *Zeolite*.

21. HUMUS. Consisting of carbonate of lime, a smaller proportion of silica, hydrogen and carbonic acid gas, and oxyde of iron: formed by the decayed remains of animal and vegetable substances: light, friable, imbibing but not retaining water, meagre, rough, humid, of a dull colour: effervescing with nitric acid, becoming cinereous in a smaller heat, in a stronger running into a frothy kind of glass. *Mould.*

*animalis.* Impalpable, greedily imbibing water, hardly effervescing with nitric acid in its rude state, but sensibly so when burnt.

*Humus animalis.* *Syst. nat.* xii. 3. p. 212. n. 14.

*Humus animalis.* *Wall. syst. min.* 1. p. 23. n. 8. a.

*Humus diverforum anim.* *Cronst. min. sect.* 246.

Found in Churchyards and other places abounding with putrid animal matter, white or cinereous, very light and fertile.

*ædalea.* Brown, in a very subtile dust.

*Humus vegetabilis.* *Syst. nat.* xii. 3. p. 209. n. 1.

Found in all inhabited places, principally originating from animal manure and depositions, so very fine as when mixed with water to pass through a coarse cloth or filtering paper: it affords the best and richest garden mould.

*ruralis.* Black when moistened, cinereous when dry.

*Humus vegetabilis.* *Syst. nat.* xii. 3. p. 209. n. 2.

*Humus atra.* *Wall. syst. min.* 1. p. 13. n. 1.

Found in all places where there is decayed vegetable matter especially in dry situations, and produces an excellent soil.

*pauperata.* Soon parting with its moisture, and when dry becoming farinaceous.

*Humus vegetabilis.* *Syst. nat.* xii. 3. p. 209. n. 3.

Found on Heaths, and produces a poor soil; because its particles are so minute and impalpable, as in dry seasons to be blown about by the least breath of wind.

*alpina.* Brown, with larger particles.

*Hum. vegetab. gross.* *Syst. nat.* xii. 3. p. 210. n. 5.

Very common in Alpine situations.

*effervescens.* Swelling after having absorbed and retained water some time.

*Hum. vegetab. aceros.* *Syst. nat.* xii. 3. p. 210. n. 4.

Common in spongy places, and may probably have its origin in the rotten roots of plants: it takes a long time in drying, and is a bad soil for the farmer or gardener, because in the spring season it intumescs by the frost at night and the heat by day, and lifts up and eradicates the smaller plants.

*Lutum.*

Very light, not combustible, black when moist.

Hum. veget. palud. *Syst. nat.* xii. 3. p. 210. n. 7.

Hum. aceros. palust. *Wall. syst. min.* 1. p. 19. n. 5.

Humus lacustris. *Cronst. min. sect.* 293. B. 2.

Found in swamps and marshes under water, and is produced by the gradual corruption of bog-plants: it is so light as to remain some time suspended in water, and is serviceable in sandy soils.

*martialis.*

With a metallic tinge.

Humus colorata. *Wall. syst. min.* 1. p. 16. n. 2.

*Syst. nat.* xii. 3. p. 211. n. 8. 10.

Found in various parts of *Britain, Sweden, Germany, Syria, &c.* in swamps and marshes, yellow-brown, reddish, purplish, or black, which colour it receives from its contamination with oxyde of iron.

*picea.*

Black, becoming solid as it dries.

Found in *Scania*, often in the cultivated lands, and requires a peculiar method of agriculture.

*maritima.*

Brown, of a saltish taste.

Argilla muriatico-salsa. *Syst. nat.* xii. 3. p. 205. n. 20.

Terra e palestina. *Cronst. min.* p. 125.

Found in the deserts on the confines of the *Red-sea, Egypt*, and *Syria*.

22. MARGA. Consisting of carbonate of lime and argil, with generally some oxyde of iron: soft, opaque, of a common form, internally earthy, light and miscible with common water by agitation, found in stratified mountains: partly soluble in nitric acid, with effervescence: hardening in the fire, and vitrifying in a strong heat.

*terrea.*

Friable, meagre, a little rough to the touch.

Argilla mixta. *Syst. nat.* xii. 3. p. 204. n. 17.

Marga friabilis. *Cronst. min.* p. 26.

Argilla rudis. *Carth. min.* 6.

Calcareous Marl. *Kirwan miner.* 1. p. 94.

Earthy Marl. *Schmeisser miner.* 1. p. 228.

Marl *Thomson chem.* 3. p. 614.

Argillaceous Marle. *Sowerby Brit. min. tab.* 14.

1. Argillaceous, lubricous, friable, plastic.  
*Wall. syst. min.* 1. p. 69. n. 1.
2. Argillaceous, compact, dry, pure, with very fine particles.  
*Wall. syst. min.* 1. p. 71. n. 2.  
*Smectis subtilis.* *Carth. min.* p. 7. n. 1.
3. Cretaceous, soiling the fingers.  
*Wall. syst. min.* 1. p. 72. n. 3.
4. Mixed with arenaceous particles, crumbling to powder in the air, a little greasy.  
*Wall. syst. min.* 1. p. 72. n. 4.

Found in almost every country in *Europe*, in strata: colour whitish, yellowish-white, or yellowish-grey, and grows paler in drying: sometimes found mixed with Mica gypsum or sand, in the latter case it is fusible into a transparent glass, sometimes impregnated with iron, very rarely with other metals: generally contains from 60 to 80 per cent. of mild carbonate of lime, the remainder of alumina or clay: specific gravity from 1,600. to 2,400.

*nilotica.* Farinaceous, brownish, cinereous when burnt, mixed with mould.

Argilla mixta humo. *Syst. nat.* xii. 3. p. 205. n. 19.

Argilla subfusca. *Mus. Telf.* 110.

2. Vitrifying. *Wall. min.* p. 31.  
*Wall. syst. min.* 1. p. 75. n. 6.

Found in the plains of *Egypt* annually overflowed by the waters of the Nile, where it is left by deposition after their recess, and is highly fertile. 2) In *Upland* in *Sweden*.

*fatiscens.* Very soft, fissile, greyish, crumbling to powder in the air.

Schistus margaceus. *Syst. nat.* xii. 3. p. 38. n. 8.

Marga indurata fatiscens. *Cronst. min. sect.* 27.

Marga ind. fiss. *Wall. syst. min.* 1. p. 73. n. 5.

Found in thicker or thinner strata, in *Sweden*, *Germany* and *Switzerland*, often between calcareous strata: colour yellowish, greenish, blueish, with often a rufous tinge.

*porosa.* Indurated, porous, precipitated from waters, breaking into indeterminate fragments.

Tophus Ludus. *Syst. nat.* xii. 3. p. 186. n. 1.

Porus aqueus solidus. *Wall. min.* 331.

Tophus solidus. *Wall. syst. min.* 2. p. 394. n. 17.

2. Tophus argillaceus. *Syst. nat.* xii. 3. p. 190. n. 17.  
Indurated calcareous marl. *Kirawan miner* 1. p. 95.  
Indurated marl. *Schmeisser min.* 1. p. 229.

Found in various parts of *Britain, Sweden, and Germany*, at the bottom of waters, particularly those which are stagnant, and becomes reddish when burnt, in proportion to the oxyde of iron which it contains; sometimes whitish or grey.

*schistosa.* Indurated, not crumbling in the air, greyish, of a slaty texture, breaking into discoid fragments.

Marga indurata strat. contin. *Cronst. min.* 28. B.

Marl shiftus. *Schmeiff. min.* 1. p. 229.

Indurated calcareous marl. *Kirwan miner.* 1. p. 95.

2. Slaty, crude, green.

Schiltus viridis. *Syst. nat.* xii. 3. p. 37. n. 4.

Found stratified in various parts of *Europe*, with frequently particles of mica interspersed, and sometimes the oxydes of metals, and fossils.

*bituminosa.* Indurated, not crumbling in the air, black, a little greasy, shining a little within, of a slaty texture, breaking into discoid fragments.

Cuprum schistoseum. *Syst. nat.* xii. 3. p. 145. n. 11.

Cuprum corrosum. *Well. lyt. min.* 2. p. 292. n. 18.

Bituminous marlite. *Kirwan miner.* 1. p. 103.

Bituminous marl shiftus. *Schmeiff. mineral.* 1. p. 230.

Bituminous marl. *Thomson chem.* 3. p. 614.

Found in stratified mountains of various parts of *Germany*, frequently containing the impression of fish and marine plants, and frequently the ores or oxydes of copper: colour greyish, bluish, or brownish-black, according to the quantity of bitumen it contains, which renders it more or less inflammable: has a greasy and somewhat glittering appearance, and a slaty texture: the thin plates are a little sonorous: burns before the blow-pipe with a black dross: specific gravity from 2,361. to 2,442.

*anonyma.* Shining within, hardish, of a dull iron colour.

*Serviere et Vincent de Villas chem. ann.* 1784. 2. p. 287.

Pyritaceous limestone. *Kirwan mineral.* 1. p. 104.

Found near *St. Ambroix* in *France*, sometimes so hard as to admit a polish and strike fire with steel: besides a little schistose earth, sulphur, and quartz, it contains iron  $\frac{1}{4}$ , argil  $\frac{1}{2}$ , carbonate of lime  $\frac{69}{100}$ .

23. MAGNESIATA. Consisting of carbonate of lime, a little black oxyde of manganese, carbonic acid gas, and water: hardish, lamellar, spontaneously separating into grains: gradually changing the colour of its surface when exposed to the air, effervescing slowly with acids, and often not without trituration: becoming black in the fire.

*granularis.* Subopaque, tranquil in the fire, breaking into indeterminate fragments, of a common form.

Sidero-calcite. *Kirwan mineral.* 1. p. 103.

Brown spar. *Schmeisser mineral.* 1. p. 224.

Brown spar. *Thomson chem.* 3. p. 612.

Found in various parts of Germany, Sweden, France, &c. in large masses: colour white, flesh and rose-colour, greyish, yellowish and reddish-white, with frequently an iridescent metallic appearance: generally opaque, and becomes brownish when exposed some time to the air: specific gravity 2,837. contains carbonate of lime 50. oxyde of iron 22. oxyde of manganese 28. *Bergman.*

*flexuosa.* Shining internally, making a grey mark, breaking into indeterminate fragments, with the foliations incurved.

*Karst. Leske mineral.* 1. p. 274.

*Hoffmann Berg. Journ.* 1789. 1. p. 191.

Found in *Hercynia*, and near *Camsdorf* and *Scharbenberg* in Sweden, reddish or greyish-white.

*spatosa.* A little shining internally, making a grey mark, breaking into rhomboidal fragments, with the foliations straight.

*Karst. Leske mineral.* 1. p. 273.

*Hoffmann Berg. Journ.* 1789. 1. p. 189.

1. Of a common form.

2. Kidney-shaped.

3. Crystallized; the crystals often very small, sometimes scattered, sometimes clustered in a series.

a. Lenticular.

Common.

Curved like the beak of a saddle.

b. Rhombic.

With the faces flat.

With the faces convex,

c. With a single pointed 6-sided pyramid.

The pyramids solid.

The pyramids hollow.

Found in the mines of *Hercynia* and *Saxony*, diaphanous, sub-opake, rarely opake: colour cinereous, reddish or yellowish-white, isabella, rosy, flesh-colour or brownish-red, yellowish or blackish brown, with sometimes several of the colours blended together, and often with a metallic lustre: differs from the *Ferrum spatiosum* by the smaller proportion of iron and oxyde of manganese it contains.

24. **PICROSPATUM.** Consisting of carbonate of lime, a nearly equal quantity of carbonate of magnesia, and a very little of the oxydes of manganese and iron: parasitical, hardish: effervescing slowly with acids.

*amarum.* **PICROSPATUM.**

Picrospatum crystallinum. *Gmel. syst.* 3. *app.* p. 441.

Bitterspath. *Karsten Berg. Journ.* 1792. 2. p. 80.

Muricalcite. *Kirwan min.* 1. p. 92.

Bitterspath. *Thomson chem.* 3. p. 612.

1. In an earthy form.

Found near *Tbionville*, of an olive colour, consisting of a large proportion of mild carbonate of lime, and a smaller of carbonate of magnesia, but no alumina.

2. In a stony form, and amorphous.

Found near *Creutzenwauld*, whitish; contains carbonate of lime 75. carbonate of magnesia 12. iron 13.

3. Crystallized.

Found in *Germany* and *Sweden*, greyish-white: the crystals are in a 6-sided prism, transparent or pellucid, with a rough surface: contains carbonate of lime 52. carbonate of magnesia 25. iron and manganese 3. *Klaproth.*

25. GYPSUM. Consisting of carbonate of lime united to sulphuric acid: light, very soft, a little frigid: not commonly effervescing with nitric acid, melting with difficulty in the fire, but easily crumbling to powder, which causes no ebullition in water but forms a paste hardening and distending by exposure to the air.

*terreum.* Powdery, of a white colour.

Calx. Gur. *Syst. nat.* xii. 3. p. 207. n. 6.

Farinaceous Gypsum. *Kirwan miner.* 1. p. 120.

Gypseous earth. *Schmeisser miner.* 1. p. 240.

Earthy Gypsum. *Thomson chem.* 3. p. 615.

Found in the fissures of gypseous rocks in *Saxony*, in the form of a white friable loose powdery substance, and seems to originate from crystallized selenite, and will not concrete without being wetted: feels dry and meagre, hardly sinks in water, is not gritty between the teeth; when heated below redness, it becomes of a dazzling white: has no lustre or transparency.

*arenaceum.* Consisting of white distinct subdiaphanous granulations.

Calx alabastrina. *Syst. nat.* xii. 3. p. 208. n. 7.

Found in *Thuringia*, and originates from Alabaster which has crumbled to powder: it resembles the last, except that its particles are larger, resembling small grains of sand, and are very gritty between the teeth.

*Alabastrum.* Compact, dry and meagre, a little shining, breaking into indeterminate fragments, of a common form, receiving a polish.

Gypsum partic. impalp. *Syst. nat.* xii. 3. p. 45. n. 3.

Gypsum part. minim. *Wall. syst.* 1. p. 154. n. 1.

Alabastrum. *Vogel mineral.* 119.

Compact Gypsum. *Kirwan miner.* 1. p. 121.

Alabaster. *Schmeisser mineral.* 1. p. 240.

Compact Gypsum. *Thomson chem.* 3. p. 615.

2. Stalactites gypseus. *Syst. nat.* xii. 3. p. 184. n. 5.

Found in *Derbyshire*, *Perfia*, and various parts of *Russia*, *Spain*, *Tuscany*, *Sicily*, and other places, in stratified mountains: colour various, sometimes spotted, intersected with veins, and depicted with various colours: does not effervesce with acids, when pure, is softer than marble, and does not take a good polish: texture shivery and glittering: specific gravity from 1,872. to 2,288. contains carbonate of lime 32. sulphuric acid 30. water 38.



*fibrosum.* Meagre and dry, brittle, breaking into long splintery fragments, of a common form.

Stirium gypseum. *Syst. nat.* xii. 3. p. 47. n. 1.

Gypsum filament. paral. *Wall. syst.* 1.

Fibrous Gypsum. *Kirwan miner.* 1. p. 122.

Fibrous Gypsum. *Schmeisser mineral.* 1. p. 242.

Fibrous Gypsum. *Thomson chem.* 3. p. 616.

Sulphate of lime. var. plumose. *Sowerby Brit. min.* t. 21.

2. Very transparent, fixed, united.

Stirium alabastrinum. *Syst. nat.* xii. 3. p. 47. n. 3.

3. Obscure, fixed, with decussate ramifications.

Stirium basaltinum. *Syst. nat.* xii. 3. p. 47. n. 4.

Found in various parts of *Britain* and *Europe*, and according to Mr. *Sowerby*, is formed by the decomposition of sulphur of iron or pyrites, the sulphur of which combining with oxygene forms sulphuric acid, which coming in contact with lime, forms this Gypsum in various fanciful modes: its texture is fibrous, filamentous, or radiate, flexuous or straight, parallel or scattered: colour white, grey, yellowish, red, or non-colour, with the colours sometimes meeting in stripes.

*schistosum.* Meagre and dry, breaking into indeterminate fragments, fibroso-lamellous, with short fibres cutting the foliations perpendicularly.

Gypsum striatum. *Wall. syst. min.* 1. p. 171. n. 7. c.

Found in *Tuscany* and *Wurtemberg*: white.

*radiatum.* Meagre and dry, radiate in a parallel manner, breaking into indeterminate fragments.

*Karst. Leske mineral.* 1. p. 228.

Found near *Coburg*, in the province of *Manusfeld*: the rays sometimes broader, sometimes narrower.

*usuale.* Meagre and dry, lamellar, with the foliations generally spherical: breaking into indeterminate fragments.

Granularly foliated-Gypsum. *Kirwan.* 1. p. 123.

Lamellated Gypsum. *Schmeisser mineral.* 1. p. 241.

Foliated Gypsum. *Thomson's chem.* 3. p. 616.

1. Shining internally.

Gypsum part. aren. micant. *Syst. nat.* xii. 3. p. 45. n. 2.

*Wall. syst. min.* 1. p. 157. *Cronst. min. sect.* 15.

2. Without lustre internally.

Gypsum argillosum. *Syst. nat.* xii. 3. p. 45. n. 1.

*Wall. syst. min.* 1. p. 156. n. 2. *Mus. Tesei.* 14. n. 12.

Found in *Britain* and various parts of *Europe*, in vast masses, and sometimes in lenticular crystals: colour yellowish or blackish-grey, cinereous, ochraceous, flesh-colour, rarely ho-

ney-colour : breaks into fine and coarse-grained concretions, sometimes cohering so loosely as to be easily triturated between the fingers.

*lamellare.* Shining, breaking into indeterminate pieces, of a common form, lamellar with the foliations incurved.

Gypsum lamellare. *Wall. syst. min.* 1. p. 158. n. 4.

Lamellated Gypsum. *Schmeisser mineral.* 1. p. 241.

Foliated Gypsum. *Thomson's Chem.* 3. p. 616.

Found in *Thuringia*, *Wirtzburg*, and *Spain*; diaphanous or opaque, smoke-colour, white, or yellowish.

*speculare.* Pellucid, white, shining, of a common form, breaking into rhomboidal specular fragments, lamellar with straight foliations.

Gypsum lamell. pellucid. *Wall. syst.* 1. p. 159. n. 5.

Broad foliated Gypsum. *Kirwan mineral.* 1. p. 123.

Found amorphous or crystallized, in various mountains of *Europe*, generally in the vicinity of salt lakes and pits: the thinner foliations are a little sonorous and very fine: the crystals are in 6-sided prisms terminating in an edge, or rhomboidal, wedge-form, tabular or lenticular; the planes of the crystals which form the acute angles are streaked longitudinally, those that form the obtuse are smooth.

*glaciale.* Pellucid, white, shining, of a common form, breaking into wedge-form fragments, lamellar with straight parallel foliations.

Natrum lapidosum. *Syst. nat.* xii. 3. p. 90. n. 8.

Gypsum crystallizatum. *Cronst. miner. lect.* 19. n. 1. A.

Found with the last species, of which it may probably be only a variety.

*Selenites.* Pellucid, shining, rhombic, lamellar with straight parallel foliations, breaking into rhomboidal fragments.

Selenites. *Syst. nat.* 1. p. 162. n. 1. tab. 18. f. 3.

Natrum lapidosum. *Syst. nat.* xii. 3. p. 91. n. 9.

Crytallus gypsea. *Amœn. acad.* 1. p. 475. t. 12. f. 3.

Selenites. *Mus. Angl. tab.* 21. f. 5, 6.

Selenites. *Rumph. mus. tab.* 52. f. 1. 12.

Gyps. crystall. *Wall. min.* p. 46. n. 1. tab. 1. f. 3.

*Wall. syst. min.* 1. p. 163. n. 9. 2. tab. 1. f. 14.

*Gmel. syst. nat.* 3. p. 446. tab. 1. fig. 17.

*Sorwerby Brit. miner.* 1. p. 141. tab. 67, 68.

Gypsum. Selenite. *Kirwan miner.* 1. p. 113.

Selenitic Spar. *Schmeisser mineral.* 1. p. 243.

Sulphat of lime. *Thomson chem.* 3. p. 614.

Found with the two former species, with the crystals generally in 6-sided prisms, terminated by 2-sided or 4-sided summits: it commonly causes double refraction: colour white or grey.

- vesiculare*. Pellucid, white, shining, lamellar with straight foliations, breaking into rhomboidal fragments, cubic.
1. With two angles truncate.  
Natrum pyritiforme. *Syst. nat.* xii. 3. p. 91. n. 10.  
*Gmel. syst. nat.* 3. p. 447. tab. 1. f. 29.
  2. With four angles truncate.  
Natrum angul. trunc. *Syst. nat.* xii. 3. p. 91. n. 9. b.  
*Gmel. syst. nat.* 3. p. 446. tab. 1. fig. 16.  
Found in various parts of *Germany*: 1) containing 10 lesser trapeziums, and 2 larger pentagons: 2) with 8 trapeziums, 4 rhombs, and 2 squares.
- tetradrum*. Pellucid, white, shining, in 4-sided prisms, breaking into rhomboidal fragments, lamellar with straight foliations.
- Spathum columnare. *Gerh. Beytr.* 2. *miner.* 1. p. 272.  
Found capillary, near *Freyenwalde*.
- prismaticum*. Pellucid, white, shining, in 6-sided prisms, breaking into rhomboidal fragments, lamellar with straight foliations.
1. With the prisms truncate.
  2. With the terminal faces ending in a point.  
Natrum flexile. *Syst. nat.* xii. 3. p. 90. n. 7.  
Crystallus selenitica. *Amæn. acad.* 1. p. 476. n. 2.  
*Gmel. syst. nat.* 3. p. 446. tab. 1. fig. 15.
  3. With the terminal faces ending in a 3-sided pyramid.  
Natrum basaltinum. *Syst. nat.* xii. 3. p. 87. n. 9.
  4. With the terminal faces ending in a 4-sided pyramid.  
*Karsten Leske mineral.* 1. p. 291.  
Found in *Germany, Austria, Switzerland, Saxony*, and various parts of *Europe*, generally accompanying the G. glacialis and specularis: the crystals large, or moderate, sometimes capillary, often with 2 of the faces smooth and the rest of the prism longitudinally striate, sometimes in pairs, or aggregate in a stellate manner.
- pyramidale*. White, shining, pellucid, breaking into rhomboidal fragments, in 3-sided pyramids, lamellar with straight foliations.
- Born. ind. foss.* 2. p. 85.  
Found in the canals, through which the salt waters of the lakes of *Upper-Austria* have been conducted.
- lenticulare*. White, shining, pellucid, breaking into rhomboidal fragments, lenticular, lamellar, with straight foliations.

*Karsten Leske mineral.* 1. p. 292.

2. With ligulate somewhat imbricate channelled opake foliations.  
*Natrum embryonatum.* *Syst. nat.* xii. 3. p. 93. n. 14?

Found near *Sangerhausen*, either solitary, or concreted into parallel or hemispherical clusters.

*globosum.* Meagre and dry, breaking into indeterminate fragments, globular.

*Born. ind. foss.* 1. p. 16. 17. 2. p. 86.

Found near *Balozania* and *Schemnitz* in Hungary, white or brown, opake or diaphanous, the globules sometimes solid, sometimes hollow, sometimes filled with crystallized gypsum.

*stillatitium.* Precipitated by water, meagre, lamellar with straight foliations, breaking into indeterminate fragments, with the fragments into which it spontaneously falls coated.

*Stalactites ambiguus.* *Syst. nat.* xii. 3. p. 184. n. 6.

*Stalactites gypseus.* *Cronst. miner. sect.* 20. 2.

1. Of a common form.
2. Of a conic form.
3. Of a branched form.
4. Of an undulate form.
5. Of a vermicular form.

Found white, grey, rarely yellow, in Sweden, 2) in Sicily, 3) in the sides of salt lakes, 4, 5) in saltpetre.

26. HEPATICUS. Consisting of carbonate of lime, baryt, sulphuric acid, and inflammable matter: soft, lamellar, of a common form, either spontaneously or when rubbed giving out an odour like liver of sulphur, not effervescing with acids: crumbling to powder in a small degree of heat, which forms a paste with water, and hardens in the air.

*solidus.* Compact, breaking into indeterminate fragments, receiving a polish.

*Gerb. Beytr. mineral.* 1. p. 281.

Found in the province of *Mansfeld*.

*squamosus.* Opake, shining internally, of very minute scattered foliations, breaking into indeterminate fragments.

*Bitumen hepaticum.* *Syst. nat.* xii. 3. p. 112. n. 10.

*Gypsum text. irreg.* *Wal. jyst. min.* 1. p. 165. n. 10.

bituminous ponderous earth. *Schmeisser miner.* 1. p. 262.

Baryto-calcite. *Kirwan min.* 1. p. 91? p. 143?

Found at *Kurzburg* in *Norway*, at *Andrarum* in *Scania*, and in *Bohemia*: colour blackish-brown, brown, yellowish, or yellowish-white.

*spatosus.*

Shining, diaphanous, smoke-colour, breaking into rhomboidal fragments, lamellar with straight foliations.

Bituminous ponderous earth. *Schmeisser miner* 1 p. 262.

Found in *Norway* and *Bohemia*, and sometimes emits a bituminous smell without being rubbed: colour white or black.

27. FLUOR. Consisting of carbonate of lime and fluoric acid: somewhat ponderous, parasitical, never hard, shining in the dark, and crackling, when heated to the degree of boiling water: not effervescing with acids, but if distilled with the mineral acids, emitting the fluoric acid gas, which has the property of dissolving glass: melting before the blow-pipe into a transparent glass.

*pulverulentus.*

Whitish, without lustre, powdery, with the larger particles not cohering.

Sandy or earthy fluor. *Kirwan mineral.* 1. p. 126.

Earthy fluor. *Schmeisser mineral.* 1. p. 236.

Earthy fluat of lime. *Thomson chem.* 3. p. 618.

Found at *Kabola Poiana* in the district of *Marmaros*, in *Hungary*, between two beds of quartz: colour light grey, greenish-white, or blueish-green: when streaked on an iron plate heated a little below redness, it diffuses a blue or pale yellow phosphorescent light: feels harsh, and stains a little: contains lime 21. alumina 15. silica 31. fluoric acid 28. phosphoric acid 1. muriatic acid 1. oxyde of iron 1. water 1. *Pelletier*.

*compactus.*

Hardish, compact, of an even texture, diaphanous, brittle, breaking into indeterminate fragments, of a common form.

Muria Chrysolampis. *Syst. nat.* xii. 3. p. 99. n. 7.

Fluor mineralis. *Wall syst. min* 1. p. 172. n. 1.

Compact fluor. *Kirwan mineral.* 1. p. 127.

Solid or compact fluor. *Schmeisser mineral.* 1. p. 236.

Compact fluor. *Thomson chem.* 3. p. 619.

Found in *Britain*, and near *Stellberg* and *Straßburg*, whitish-grey, more or less passing into green, often spotted: fracture even or conchoidal: specific gravity from 3,120. to 3,165.

*spatosus.* Hardish, shining, brittle, of a common form, breaking into pyramidal fragments, lamellar.

Muria lapidosa. *Syst. nat.* xii. 3. p. 100. n. 3.

Fluor mineralis. *Wall. syst. min.* 1. p. 173. n. 2.

Fluor spar. *Kirwan mineral.* 1. p. 127.

Sparry fluor. *Schmeisser mineral.* 1. p. 237.

Fluor spar. *Thomson chem.* 3. p. 619.

2. With the fragments into which it falls spontaneously, resembling very minute granulations.

Fluor mineral. granular. *Wall. syst.* 1. p. 175. n. 3.

Found in *Britain, Norway, Sweden, Spain, and Germany*, white smoke-colour, green, violet, purple, rose, honey-colour, or varied with spots, blotches or veins, semipellucid or transparent, breaking into 3, rarely 4-sided fragments, takes a fine polish, and is manufactured into various vases and figures: contains carbonate of lime 75. fluoric acid 16. water 27.

*tabularis.* In rhombic oblong tables.

Fluor cryst. lamell. *Wall. syst.* 1. p. 177. n. 4. d.

*Storr. Alpenr.* 2. p. 46.

Found in *Switzerland, Alsace, and Saxony*.

*cubicus.* Hardish, shining, smooth, lamellar, brittle, breaking into pyramidal fragments, cubic.

Fluor cryst. rhomb. *Wall. syst.* 1. p. 176. n. 4. a.

Fluor cryst. cubic. *Cronst. min. sect.* 100.

Fluate of lime. *Sowerby Brit. miner. tab.* 11. 73.

1. With the cubes perfect.
2. With the angles of the cube truncate.
3. With the margins of the cube truncate.
4. With the angles and margins of the cube truncate.
5. With the margins terminating in a point.  
The faces flat.  
The faces concave.
6. With the margins of the cube terminating in a 3-sided pyramid.

Found in *Derbyshire and Northumberland, Spain, France, Saxony, Germany, &c.* of the same variety in colours as Fl. spatosus; most frequently pellucid, rarely opaque: the crystals solid or hollow, or containing a small drop of water or some fossil, and placed in a decussate manner, laterally, or irregular, or aggregate in a kidney or imperfectly globular form.

*pyramidalis* Hardish, shining, lamellar, brittle, breaking into pyramidal fragments.

Alumen spatosum. *Syst. nat.* xii. 3. p. 102. n. 5.

Crystallus alumini formis. *Amæn. acad.* 1. p. 481.

Fluor. min. octaedric. *Wall. Syst.* 1. p. 176. n. 4. b.

Fluor spar. *Kirwan mineral.* 1. p. 127.

Sparry fluor. *Schmeisser min.* 1. p. 237.

Fluor spar. *Thomson chem.* 3. p. 619.

Fluate of lime. *Sowerby Brit. min. tab.* 26, 27.

*Rasbleigh Brit. miner.* 1. tab. 24. fig. 1, 2.

1. With a single pyramid.

The pyramid inverted.

The pyramid straight.

The pyramid 3-sided.

The pyramid truncate.

Truncate with spherical faces.

The pyramid 6-sided, with sphærico-concave faces.

2. With a double pyramid.

The pyramid 4-sided.

Found in *Derbyshire*, *Devonshire*, and *Cornwall*, and in various parts of *Sweden*, *Saxony*, and *Bohemia*; the colours vary like *Fl. spatiosus*.

28. APATITES. Consisting of carbonate of lime, and phosphoric acid: brittle, hardish: soluble in nitric acid, melting in the fire with difficulty, but when powdered and thrown upon burning coals, emitting a yellowish-green phosphorescent light.

*rupestris.* Compact, opaque, whitish.

*Cronst. Phys. Journ.* 1788. Aug. p. 248.

Phosphorite. *Kirwan miner.* 1. p. 129.

Phosphorated limestone. *Schmeisser miner.* 1. p. 233.

Phosphat of lime. *Thomson chem.* 3. p. 616.

Found at *Estramadura* in *Spain*, forming extensive strata with alternate strata of solid quartz: it melts with borax into a white enamel.

*octaedrus.* In 8-sided tables, of a rather greasy lustre, parasitical, breaking into indeterminate fragments, semipellucid, of a minutely granular texture, which is lamellar when broken transversely.

*Karsten Schr. Berl. Natur.* 9. p. 355.

Found near *Ehrenfriedersdorf* in *Saxony*.

*tabularis.* In 6-sided tables, of a rather greasy lustre, parasitical, breaking into indeterminate fragments, of a minutely granular texture, which when broken transversely is lamellar.

*Karsten Schr. Berl. Naturf. 9. p. 355.*

Found near *Ehrenfriedersdorf* in *Saxony*.

*prismaticus*. In 6-sided prisms, of a rather greasy lustre, parasitical, breaking into indeterminate fragments, of a minutely granular texture, which when broken transversely is lamellar.

*Werner Bergm. Journ. 1788. 1. p. 76.*

*Klaproth Bergm. Journ. 1788. 1. p. 294.*

*Karsten Schr. Berl. Naturf. 9. p. 355.*

Phosphorite. *Kirwan miner. 1. p. 129.*

Apatite. *Schmeisser mineral 1. p. 232.*

Common Apatite. *Thomson chem. 3. p. 617.*

Found in *Cornwall*, *Saxony*, and *Germany*, with tin ore and fluor: colour green, pale violet, reddish, or white, rarely yellowish, cinereous, blue or olive-colour: loses its colour and transparency in the fire, but melts with great difficulty: is very finely striate longitudinally: crystals small, solitary or irregularly cohering; the prisms sometimes perfect, sometimes terminated at one or both ends with a 6 sided pyramid, the lateral margins sometimes ending in a point, and the terminal ones with the angles truncate, sometimes the lateral margins are rounded: specific gravity = 2218: 1000.

*chrysolithinum*. In 6-sided prisms, terminated at both ends by a 6-sided pyramid, green, breaking into indeterminate fragments, of a conchaceous texture when broken transversely.

*Werner Bergm. Journ. 1790. 7. p. 74, &c.*

*Romé de l'Isle Crystall. 2. p. 277.* Chrysolithe.

*Spatum chrysolithinum. Gmel. syst. nat. 3. p. 98.*

Found near *Carboneira* in *Spain*, in small solitary crystals, which are sometimes hollow: it effervesces a little with the nitric acid, and emits very little if any phosphorescent light when powdered and thrown upon burning coals: specific gravity = 3098: 1000.

*columnaris*. In 8-sided prisms, of a rather greasy lustre, parasitical, semipellucid, breaking into indeterminate fragments, of a minutely granular texture, which when broken transversely is lamellar.

*Karsten Leske mineral. 1. p. 283.*

Found near *Schneeberg* and *Ehrenfriedersdorf* in *Saxony*.

*triadrus*. In 3-sided prisms, of a rather greasy lustre, parasitical, semipellucid, breaking into indeterminate fragments, of a minutely granular texture, which when broken transversely is lamellar.

*Karsten Schr. Berl. Naturf. 9. p. 355.*

Found near *Ehrenfriedersdorf* in *Saxony*.



29. BORACITES. Consisting of carbonate of lime, a larger proportion of carbonate of magnesia, the greater part boracic acid, and a little alumina, silica and oxyde of iron: hard, lamellar, lightish, cubic: becoming electric by heat, not effervescing with acids, crackling in the fire, and before the blow-pipe contracting and melting into a yellowish glass.

*cubicus.*

# BORACITES.

*Westrumb Chem. Annal.* 1788. 1. p. 483. Sedativspat.

Boracite. *Kirwan mineral.* 1. p. 172.

Boracit. *Schmeisser miner.* 1. p. 234.

Borat of magnesia. *Thomson chem.* 3. p. 626.

Found at *Kalkberg* near *Luneburg*, seated in a bed of gypsum: colour hyaline or greyish-white, sometimes passing into violet or sea-green: cubes very small, with truncated edges and angles, so that the faces of the truncated angles exhibit alternately hexagons and triangles: fracture compact, flat, conchoidal: contains boracic acid 68. carbonate of magnesia 13. carbonate of lime 11. silica 1. argil. 1. iron 6.

## ORDER IV. ARGILLACEOUS.

*Containing principally aluminous earth.*

30. ALUMINARIS. Consisting almost entirely of alumina: meagre to the touch, light, without lustre, earthy, adhering a little to the tongue, staining a little: nearly soluble in nitric acid, contracting and hardening in the fire, emitting sparks before the blow-pipe.

*nativa.*

### ALUMINARIS.

Native argill. *Kirwan miner.* 1. p. 175.

Native argillaceous earth. *Schmeisser miner.* 1. p. 159.

Native alumina. *Thomson chem.* 3. p. 502.

Found in various parts of *Britain, Muscovy, and Saxony*, in kidney-form masses: snow-white, very soft, breaking into indeterminate fragments, and does not readily diffuse itself in water.

31. ARGILLA. Consisting of alumina and silica, with generally some oxyde of iron and inflammable matter: opaque, without lustre, of a common form, soft to the touch, earthy, lightish, soft, imbibing and retaining water and oil, by each of which it is softened, and rendered plastic by the former, and emitting an earthy smell: not effervescing with nitric acid, contracting and becoming harder in the fire.

*porcellana.*

Meagre, white, friable, adhering to the tongue, becoming white when burnt, and in a very strong heat forming porcelain.

Terra porcellana. *Cronst. miner.* 78. A.

Argilla apyra. *Wall. syst. min.* 1. p. 51. n. 9.

Porcelain clay. *Kirwan miner.* 1. p. 178.

Porcelane clay. *Schmeisser miner.* 1. p. 157.

Porcelain earth. *Thomson chem.* 3. p. 534.

1. In a compact form.

Argilla apyra. *Syst. nat.* xii. 3. p. 200. n. 1.

Argilla apyra. *Wall. min.* 19.

2. In a powdery form.

Marga porcellana. *Wall. min.* 23.

Argilla porcellana. *Vogel miner.* 33.

3. Mixed with micaceous particles.

Argilla porcellana. *Syst. nat.* xii. 3. p. 200. n. 3.

Found in *Cornwall, Japan, China, Saxony*, and various parts of *Europe*, and is supposed to originate from decomposed felspar: colour white, greyish, reddish or yellowish-white: adheres very slightly to the tongue, and feels soft but not greasy: does not change its colour when exposed to heat, but becomes white, and transparent in proportion to the quantity of silica it contains: it is principally used in the manufacture of china ware: contains alumina 60. silica 20. air and water 12.

*Leucargilla.*

Very soft and greasy to the touch, adhering to the tongue, shining when rubbed, becoming first blackish and paler when burnt, apyrous.

Argilla apyra. *Syst. nat.* xii. 3. p. 200. n. 2.

Argilla apyra. *Wall. syst. min.* 1. p. 53. n. 10.

Potters clay. *Kirwan mineral.* 1. p. 187.

Pipe clay. *Schmeisser mineral.* 1. p. 156.

Common clay. *Thomson chem.* 3. p. 535.

Found in *Normandy*, near *Cologne, Livonia*, and other parts of the world: colour varying from pure white to black, and is often variegated: when first exposed to heat, it becomes blackish, from the inflammable matter it often contains, but by continued heat it turns pure white: it is used for tobacco-pipes and various vessels.

*Lithomarga.*

Friable, very greasy to the touch, shining, scaly.

Talcum subfriabile. *Syst. nat.* xii. 3. p. 51. n. 1.

Lithomarga. *Kirwan miner.* 1. p. 187.

Lithomarge. *Schmeisser miner.* 1. p. 160.

Potters' clay. *Thomson chem.* 3. p. 535.

2. Somewhat friable, green, making a mark.

Talcum viridans. *Syst. nat.* xii. 3. p. 51. n. 1.

3. Hard, receiving a polish.

Terra miraculosa. *Schuz. Nov. Act. Ac. Cæs. Nat. Cur.* 3. app.

Indurated Lithomarge. *Schmeisser mineral.* 1. p. 160.

4. Emitting phosphorescent sparks in the dark, when rubbed with the point of a pen.

*J. Trebra Chem. Ann.* 1784. 1. p. 387. *Kirwan* 1. p. 190.

*Bruchmann Chem. Ann.* 1785. 1. p. 449.

Indurated Lithomarge. *Schmeisser min.* 1. p. 160.

Found in various parts of the world, in clay and limestone rocks, in long layers between clay and limestone, sometimes in the form of powder, sometimes compact, in which latter case it adheres to the tongue: colour ochraceous, greyish or reddish-white, margaritaceous, lavender-blue, violet, flesh-colour, brownish-red, green, or a mixture of several colours: it alters its colour in the fire, becomes very hard, and by continued heat melts into a red porous slag: is entirely diffusible in water, and when duly moistened very ductile, on which account it is highly useful in potteries and china manufactures: adheres moderately to the tongue, and acquires some polish by friction: fracture fine earthy, often conchoidal: contains silica 43,5. alumina 33,2. lime 3,5, iron 1,0. water 18,0. *Vauquelin*.

*fullonica*. Greasy to the touch, shining by friction, lamellar, falling into powder in water, crumbling in the open air, melting before the blow-pipe into a white glass.

*Argilla vitrescens*. *Wall. syst. min.* 1. p. 48. n. 7.

Fuller's earth. *Kirwan miner.* 1. p. 184.

Fuller's earth. *Thomson chem.* 3. p. 538.

Found in *Britain*, *Sweden*, *Saxony*, and *Portugal*; brown or grey, with generally a shade of green, rarely flesh-colour: receives a polish from friction, does not adhere to the tongue, feels greasy, texture earthy, structure somewhat slaty, fracture imperfectly conchoidal, and without lustre or transparency. A piece from *Hampshire* contained silica 51,8. alumina 25,0. carbonate of lime 3,3. oxyde of iron 3,7. carbonate of magnesia 0,7. moisture 15,5. *Bergman*. From the great avidity with which it absorbs oil, it is used by fullers to take grease out of cloth.

*crustacea*. Greasy, lamellar, falling into small pieces in water and frothing when agitated, before the blow-pipe melting into a spumid glass.

*Argilla fullonica*. *Syst. nat.* xii. 3. p. 201. n. 7.

*Argilla vitrescens*. *Wall. syst. min.* 1. p. 10. n. 6.

Found on Mount *Osmund* in *Sweden*; cinereous.

*Lemnia*. Greasy, shining by friction, adhering a little to the tongue, very soft, lightish, of a conchoidal texture.

*Argilla incarnata*. *Syst. nat.* xii. 3. p. 201. n. 6.

*Terra Lemnia*. *Cronst. min.* 85 B.

*Argilla crustacea*. *Waller syst. min.* 1. p. 11. n. 6. C.

Lemnian earth. *Kirwan miner.* 1. p. 190.

*Terra Lemnia*. *Schmeissner miner.* 1. p. 165.

Lemnian earth. *Thomson chem.* 3. p. 588.

Found principally in the title of *Lemnos*, and in *Silesia*; generally dull isabella, yellow or pale liver-colour, rarely diluted

flesh-colour, with sometimes black spots or shrub-like ramifications: surface smooth and polished like agate: fracture conchoidal, with angular fragments: contains silica 47.0. alumina 19.0. carbonate of magnesia 6.0. carbonate of lime 5.4. water and air 17.0. *Bergman.*

*Sapo.* Greasy, lightish, very soft, thinning by friction, adhering to the tongue, brownish black.

Bergseif. *Werner in Cronst. mineral.* 84.

Found near *Olkutsch* in *Poland*, of an earthy texture.

*communis.* Very soft, greasy, adhering to the tongue, plastic, staining the fingers a little, of an earthy texture, growing red in the fire, and before the blow-pipe melting into a greenish glass.

*Argilla communis* *Cronst. mineral.* 90. A.

Brick-clay. *Schmeisser miner.* 1. p. 163.

Common clay. *Kirwan miner.* 1 p. 179.

Common clay. *Thomson chem.* 3. p. 535.

1. Of a blueish colour.

*Argilla communis*, *Syst. nat.* xii. 3. p. 202. n. 9.

*Arg. vitresc. rudis.* *Wall. syst. min.* 1. p. 40. n. 1.

2. *Argilla sigulina siccitate rupturis subtessellata.*

*Syst. nat.* xii. 3. p. 202. n. 10.

*Argilla vitrescens, exsiccata tessularis.*

*Wall. syst. mineral.* 1. p. 44. n. 3.

*Argilla incarnata.* *Syst. nat.* xii. 3. p. 202. n. 11.

3. *Linus. Terra lateritia. Vogel miner.* 31.

Found in almost every part of the globe, frequently forming vast strata a little below the surface, and often bearing the impressions of vegetables: colour blueish or yellowish-grey, smoke-colour, dull blueish, rarely green or flesh-colour, and impregnated with a greater or less degree of silica.

*indurata.* Soft, a little greasy, adhering slightly to the tongue, crumbling and softening in water.

*Argilla arcte coher.* *Wall. syst. min.* 1. p. 62?

Indurated clay. *Kirwan mineral.* 1. p. 131.

Indurated clay. *Thomson chem.* 3. p. 536.

2. Granular when dry.

*Argilla vitrescens.* *Wall. syst. min.* 1. p. 10. n. 5.

Found in every part of the globe, lightish, yellowish, blueish or greenish-grey, reddish-brown, dull rosy, or greenish, or varied with rounded spots: of an earthy texture, and discovers but little ductility: falls to powder, but does not diffuse itself in water, and is sometimes so hard as to serve the purposes of building stones.

- fissilis.* Very soft, rather meagre and dry to the touch, adhering a little to the tongue, of a slaty texture, breaking into discoid fragments.  
*Schistus argillaceous.* *Syst. nat.* xii. 3. p. 38. n. 7.  
*Argilla vitref. fissil.* *Wall. syst. min.* 1. p. 45. n. 4.  
 Shistose clay. *Kirwan mineral.* 1. p. 182.  
 Slaty clay. *Schmeißer miner.* 1. p. 168.  
 Shistose clay. *Thomson chem.* 3. p. 536.  
 Found in *Britain* and various parts of *Europe*, in large layers, generally over and under veins of coal, and is frequently penetrated with bitumen: colour black or grey, rarely blue, sometimes yellowish, reddish or brown, when it contains much bitumen is of a blackish-brown colour, appears like bad coal, and burns with a weak flame and sulphureous smell; frequently bears the impression of plants, especially those of the equisetum, adiantum and fern tribe: gives a whitish or grey streak, and moulders gradually in water.
- sterilis.* Somewhat meagre, lamellar, white when dry, growing reddish and hardening a little in the fire, melting in a greater degree of heat.  
*Argilla mixta.* *Syst. nat.* xii. 3. p. 203. n. 14.  
*Argilla fissilis alba.* *Wall. syst.* 1. p. 45. n. 4. a.  
 Found in the barren plains of *Sudermannia* in *Sweden*, especially where birch trees flourish, and forms entire strata alternating with beds of sand.
- bullosa.* Greasy, soft, shining by friction, adhering a little to the tongue, plastic, growing reddish and blistery in the fire.  
 Found in *Transylvania*.
- Bolus.* Greasy, shining by friction, dissolving in the mouth, crumbling into powder immediately in water, growing reddish and easily dissolving in the fire, of a conchoidal texture.  
*Argilla ore liquescens.* *Syst. nat.* xii. 3. p. 203. n. 15.  
*Argilla vitrescens.* *Wall. syst. min.* 1. p. 49. n. 8.  
*Bolus.* *Cronst. min.* 86. *Vogel min.* p. 36.  
*Bole.* *Kirwan mineral.* 1. p. 190.  
*Bole.* *Schmeißer mineral.* 1. p. 165. *Thomson chem.* 3. p. 587.
2. Odorous earth from Portugal.  
 Found in *Armenia*, *Italy*, *France*, and *Germany*, and is frequently produced from decayed lavas: colour generally dull red or brown, sometimes yellow, flesh-colour, cinereous, and in innumerable varieties; near *Idria* in *Carniola*, it is found mixed with cinnabar, and near *Kafnick* in *Hungary*, combined with silver.

*Cimelia.* Pearl-grey, becoming reddish when exposed to the air, adhering strongly to the tongue, not staining, becoming white before the blow-pipe.

*Cimolite.* *Thomson chem.* 3. p. 536.

Found in the Isle of *Argentiers*, in the *Archipelago*, where it is used for whitening stuffs: texture earthy, fracture uneven, opaque, soft, breaking with difficulty: specific gravity 2,000. contains silica 63,00. alumina 23,00. iron 1,25. water 12,00. *Klaproth.*

*sinensis.* Rather meagre to the touch, rufous variegated with ochraceous dots and spots, softening in water.

*Argilla flavescons.* *Syst. nat.* xii. 3. p. 201. n. 4.

*Poliershiefer.* *Thomson chem.* 3. p. 537?

Found near *Montmartre* in *France*, and in *China*, where it constitutes the soil upon which cotton, rice and indigo are cultivated: it is used in the making of bricks which are intended to be under water.

*Rubrica.* Soft, staining, adhering to the tongue, red, brittle, does not become ductile in water, of an earthy texture.

*Talcum subfissile.* *Syst. nat.* xii. 3. p. 51. n. 3.

*Ochra ferri rubra.* *Wall. syst. min.* 2. p. 260. n. 22. c.

*Red. Reddle.* *Kirwan mineral* 1. p. 193.

Found in *Siberia*, *Dalecarlia*, *Bohemia*, *Portugal*, and *France*, generally among iron ore, with which it commonly abounds: colour dark cochinnelle red, or intermediate between brick and blood-red: fracture earthy, sometimes conchoidal: feels rough, assumes a polish from the nail, strongly stains the fingers, adheres to the tongue, falls immediately to powder in water, does not effervesce nor easily dissolve in acids, crackles and grows black when heated to redness, and melts at last into a dark greenish-yellow frothy enamel.

*lutea.* Very soft, staining the fingers, adhering to the tongue, ochre-yellow.

*Gelbe erde.* *Hoffmann Berg. Journ.* 1788. p. 521.

*Yellow ochre.* *Kirwan mineral* 1. p. 194.

Found near *Webrau*: feels smooth or somewhat greasy: fracture earthy, or inclining to the conchoidal: adheres strongly to the tongue, takes a high polish from the nail, and strongly stains the fingers: falls immediately to pieces in water, with some hissing, afterwards to powder, but does not dissolve itself through it: does not effervesce with acids, or easily dissolve in them: heated to redness it crackles, hardens, acquires a red colour, and gives a reddish streak, and melts at last into a liver-brown porcelain mass: contains alumina 50. oxyde of iron 40. water acidulated by sulphuric acid 10.

*viridis.* A little greasy, soft, compact, green, swelling in the fire and becoming first blackish, then red, and at last yellow.

Bolus viridis. *Syst. nat.* xii. 3. p. 203. n. 13. c.

Terra verde. *Cronst. min. sect.* 86, 1. V.

Found on Mount Baldo, Sweden, Normandy, Saxony, and Bohemia, frequently within the Almond stone: makes a green mark.

*Tripolitana.* Harsh and dry, soft, lightish, adhering to the tongue, melting with difficulty, when rubbed with metal assuming a metallic splendor.

Argilla scabra. *Syst. nat.* xii. 3. p. 202. n. 8.

Tripolia solida. *Wall. syst. min.* 1. p. 91. n. 1.

Tripoli. *Kirawan mineral.* 1. p. 202.

Tripoli. *Schmeisser miner.* 1. p. 175. *Thomson chem.* 3. p. 533.

Found in the island Tarsus in the South Seas, in the kingdom of Tunis, in Naples, at the river Uda in Russia, Sweden, Flanders, Bohemia, Austria, and various parts of Germany, in stratified mountains and not unfrequently mixed with sulphur: colour whitish, yellowish-grey, cream and ochre-yellow: is found solid, has a dull earthy appearance when broken, and breaks into indeterminate obtuse regular pieces, is soft and sandy between the teeth, and absorbs water with a noise: does not stain the fingers, and frequently reddens when heated: contains silica 90. alumina 7. iron 3. *Hafse.*

*intumescens.* Reddening a little when heated, spongy when dry, greedily imbibing water with intumescence and retaining it.

Argilla mixta. *Syst. nat.* xii. 3. p. 203. n. 15.

Argilla vitreus. *Wall. syst. min.* 1. p. 43. n. 2.

Found every where in barren plains, particularly in Sweden, and on account of its fluctuation and trembling is very dangerous to travellers; for the surface being dried up is elastic like leather, while the mass under it is of the consistence of putty.

*grandæva.* Meagre, somewhat plastic, growing reddish and hardening in the fire, friable and a little dirty when dry, slowly imbibing water with intumescence.

Argilla mixta glarea. *Syst. nat.* xii. 3. p. 204. n. 16.

Argilla glarea mixta. *Waller syst.* 1. p. 56. n. 12.

Found in Sweden, particularly in Dalecarlia, grey, brown, or reddish, and in the summer becomes so hardened, as not to be broken with a hammer or divided by a wedge: when sifted it is an excellent material in the formation of bakers' ovens.



- scutula.* Somewhat meagre, a little plastic when moistened, dusky when dry, melting into solid glass in the fire.  
*Calx palustris* *Syst. nat.* xii. 3. p. 207. n. 5.  
*Argilla vix coherens.* *Wall. syst.* 1. p. 61. n. 14.  
 Found in Sweden, chiefly under bogs and marshes, grey or white; the latter is used for whitening walls.
- arvensis.* Cinereous, forming small clods when moistened, splitting into large clefts while drying and becoming at last powdery, vitrifying in the fire.  
*Argilla humo mixta.* *Wall. syst.* 1. p. 55. n. 11.  
 Found every where in cultivated lands.
- Umbra.* Penetrated with bitumen, brown, making a mark, growing reddish when burnt.  
*Argilla humosa.* *Syst. nat.* xii. 3. p. 204. n. 18.  
*Humus colorata.* *Wall. syst. min.* 1. p. 17. n. 3.  
 Umber. *Kirwan. mineral.* 1. p. 197.  
 Martial clay. *Schmeisser mineral.* 1. p. 164.  
 Found in Britain, Italy, Germany, &c. and is used by painters: colour brown or blackish, adheres to the tongue, and moderately stains the fingers: consists principally of particles of decayed wood mixed with bitumen.
- vitriolacea.* Brown, stiptic, turning a decoction of galls black.  
*Argilla mixta fusca.* *Syst. nat.* xii. 3. p. 205. n. 21.  
 Found every where under boggy land, and is a mixture of clay and pyrites.
- salsa.* Of a salt taste.  
*Hiaerne tentamen chem.* 1.  
*Born. ind. foss.* 2. p. 93.  
 Found in the maritime parts of Austria, and in the confines of salt pits, cinereous or red, and is impregnated with muriate of soda.
- cobaltifera.* Black, forming a blue glass when melted with borax.  
*Gejn. Hist. Cobalt.* 1. p. 21. 35.  
 Found in the mines of Wirtemberg.
- cuprifera.* Brown, producing a blue colour with heated spirit of ammonia.  
*Born. brief.* 7. p. 33, 34. 8. p. 43.  
 Found in the mines of Germany; contains the oxydes of iron and copper, in the proportion of about 26 per cent. of the latter.
- argentifera.* Soft, plastic, exhibiting silver when fused with lead.  
*Born. ind. foss.* 1. p. 83. 84.  
*Ferber ab. die Gebirg. Ungar.* p. 57.

Found near *Criesdorf* in *Bavaria*, and near *Schemnitz* in *Hungary*, cinereous, yellowish, or yellow-red; contains  $\frac{7}{800}$  of silver.

*aurifera*. Soft, plastic, blueish, exhibiting gold when fused with lead.

*Born. ind. foss.* 1. p. 67.

Found in the mines of *Transylvania*, near *Herczigan* and *Facebai*.

32. PUTEOLANA. Consisting of alumina, silica, and iron, with generally some carbonate of lime: friable: mixed up with water and quicklime becoming so hard as not to be penetrated by water, easily melting in the fire into a black scoria.

*gemina*. Of a dull colour, tinged, readily obeying the magnet.

*Terra pouzzolana*. *Cronst. min. sect.* 207. n. 8. 1.

*Cæmentum pulverulentum*. *Wall. jyst.* 1. p. 95. n. 7.

*Pouzzolana*. *Kirwan mineral.* 1. p. 411.

*Pouzzolano*. *Thomson chem.* 4. p. 149.

Found in the volcanic mountains of *Italy*, even in those that are extinct, chiefly about *Naples* and *Rome*, where it is collected into tumular masses: colour dull red, brown or black: surface rough, uneven, and of a baked appearance: fracture uneven or earthy and porous: it is not diffusible in cold water, but in boiling water it gradually deposits a fine earth: with a small portion of lime it makes an excellent mortar, which hardens even under water.

*assimilis*. Of a dull colour, tinged, hardly obeying the magnet.

*De S. Fond sur les diff. espec. de Pouz.* 1780. 8.

Found near *Chernavari* in *France*, in *Germany*, and *Franconia*, and probably originates from decayed argillaceous stones.

*Cineres*. Cinereous, in the form of ashes.

*Cineres Vulcanorum*. *Cronst. miner.* 297.

Volcanic ashes. *Kirwan mineral.* 1. p. 410.

Volcanic ashes. *Thomson chem.* 4. p. 150.

Found in the neighbourhood of most volcanic mountains, from which they are ejected with vast force, and often to a great height and distance, frequently covering vast surfaces, and sometimes burying whole cities: they are sometimes so subtile as to fill up the minutest crevices: colour brownish or reddish-grey: they effervesce slightly with acids, have frequently a magnetic power, and usually contain about half their weight of argill, a small proportion of calx, magnesia and iron, the remainder is silica.

*arenacea.* Cinereous, consisting of distinct granulations.

*Pumex cinerarius.* *Syst. nat.* xii. 3. p. 181. n. 5.

*Porus igneus.* *Wall. syst. min.* 2. p. 375. n. 1.

Volcanic sand. *Kirawan miner.* 1. p. 410.

Volcanic sands. *Thomson chem.* 4. p. 150.

Found in the neighbourhood of Volcanos, and are composed of small hard grains varying in size: they readily sink in water, and are usually mixed with small fragments of felspar, lava, magnetic iron-stone, &c. they often cover a great extent of ground, sometimes to the extent of 50 leagues round the volcano, and several feet thick.

33. CÆMENTUM. Consisting of iron, alumina, a larger quantity of silica, and generally a small proportion of carbonate of lime: hardish, lightish, porous, of an earthy texture, imbibing the water in which it is immersed with a hissing noise, crackling when dried and pressed with the thumb, rough, without lustre: when powdered and beat up with water and quicklime becoming so hard as not to be penetrated by water, easily melting in the fire into a black scoria.

*Tufa.* Collected into entire cliffs and vast strata about volcanic mountains, of a common form.

*Giesen litholog. Vesuvian.* p. 174.

*Tufas.* *Kirawan mineral.* 1. p. 414.

*Tuffwacke.* *Schmeißer mineral.* 1. p. 187.

Found in the neighbourhood of volcanos, particularly in *Italy*, about *Naples* and *Rome*, and consists of compact masses of pouzzolano, sand, flaggs, pumice, and other stones of volcanic origin: colour mostly smoke colour, cinereous, blackish, brown, ochraceous, yellowish-grey, or brownish yellow, rarely reddish, greenish or variegated: it is commonly magnetic, of an earthy fracture, and not easily decomposed by the action of the air: sometimes it has a small mixture of bones, shells and other calcareous substances, and then effervesces a little with acids.

*Tarras.* Forming large strata under the surface of the common soil, of a common form.

*Cæmentum induratum.* *Cronst. miner.* 207. n. 8. 2.

*Cæmentum induratum.* *Wall. syst. min.* 1. p. 97. n. 2.

*Trafs or Terras.* *Kirawan mineral.* 1. p. 413.

*Trafs or Tarras.* *Schmeißer mineral.* 1. p. 187.

Found on the banks of the *Rhine*, principally near *Andernach* and on Mount *Vogelberg*, some feet under the surface, where streams of water have not had access, dull grey or blackish, rarely variegated: surface rough and porous: fracture commonly earthy, rarely lamellar: it contains fragments resembling pumice, crystals of hornblende, mica, clay, slate, quartz, marble, iron ore, and other substances: when pounded it makes the best cement for buildings under water.

*columnare*. Prismatic.

1. In 6-sided prisms.

2. In 5-sided prisms.

Found on the banks of the *Rhine*, and sometimes near the base of Mount *Etna*, in columnar masses of a grey or Isabella-yellow colour, standing close to each other, and forming internally one common mass.

34. CARIOSUS. Consisting of alumina, silica, and carbonate of lime, with a small portion of iron: light, soft, porous, falling to powder in water: effervescing with nitric acid, hardening and growing a little red in the fire.

*anglicus*. CARIOSUS.

*Rotten-stone*.

*Tripela cariosa*. *Wall. ffl. min.* 1. p. 92. n. 2.

*Creta fusca terra cariosa dicta*. *Da costa foff.* 87.

Found in *Derbyshire*, *Glamorganshire*, and other coal countries, generally over veins of coal: colour Isabella-yellow, dull grey or brown: it easily moulders in the open air, and soon falls to powder in water, for which reason it has been denominated Rotten-stone. It is principally used for polishing metals and other substances.

35. ARDESIA. Consisting of alumina and silica, with generally a little oxyde of iron and carbonate of lime, and sometimes some magnesia and petroleum: soft, of a slaty texture, generally breaking into discoid fragments, opaque, of a common form, imbibing water, but so slowly as not to be softened, when moistened exhaling an argillaceous odour: not effervescing with nitric acid, melting into a turbid scoria by a considerable degree of heat; found in primitive as well as stratified mountains, and when in the former of a greasy lustre; forming entire mountains or their principal part.

*Novacula.* A little polished, shining within, subopaque, hardish, greenish-grey, making a whitish mark.

*Schistus script. alba.* *Syst. nat. xii. 3. p. 37. n. 1?*

*N. vaculite, Turkey hone.* *Kirwan mineral. 1. p. 238.*

*Whetstone.* *Schweisser mineral. 1. p. 174.*

Found in shistose mountains, forming considerable layers, chiefly in the *Levant*, near *Lauestein* in *Burkith*, *Siberia*, and near *Frieberg* in *Saxony*: fracture slaty, approaching to shivery; does not adhere to the tongue: receives an imperfect polish, hardens in the air and in oil, and when saturated with the latter makes an excellent whetstone.

*tabularis.* A little polished, soft, greyish-black, making a whitish mark, with straight foliations.

*Schistus tabularis.* *Syst. nat. xii. 3. p. 37. n. 2.*

*Schistus subtilior niger.* *Wall. syst. 1. p. 336. n. 1.*

Found in *Switzerland*, *Hungary*, *Franconia*, and *Saxony*: admits an imperfect polish, and is sometimes variegated with darker orbicular or oblong spots; when powdered effervesces in a very slight degree with nitric acid: is rather light, and is used for tables and slates.

*regularis.* A little polished, rather hard, blueish-black with a cinereous streak, with straight foliations.

*Schistus Ardesia.* *Syst. nat. xii. 3. p. 38. n. 5.*

*Schistus durus.* *Wall. syst. min. 1. p. 336. n. 1.*

*Argillite, Argillaceous Schistus, Slate.* *Kirwan min. 1. p. 168.*

*Argillaceous Schistus.* *Schweisser mineral. 1. p. 168.*

*Argillaceous Schistus.* *Thomson chem. 3. p. 587.*

2. Reddish or brownish-red.
3. Of a purple colour.
4. Reddish-purple.
5. Greenish-grey.

Found in many mountains of *Britain*, and various parts of *Europe*, generally in layers, and frequently marked with the impression of living bodies and plants: when broken shines a little from a mixture of micaceous particles or granulations of quartz: does not adhere to the tongue, or imbibe water, and is principally used for the covering of houses.

*solida*. Blackish, of a compact slaty texture, giving a clear sound when struck, making a cinereous streak.

*Schistus scriptura cinerea*. *Syst. nat.* xii. 3. p. 38. n. 6.

*Schistus solidus durus*. *Wall. syst.* 1. p. 342. n. 7?

Found in *Sweden*, *Spain*, and *New Spain*, of a shivery fracture, and a blackish, brown, grey, or reddish colour.

*compactissima*. Of a dull colour, very compact, and solid, hardish, leaving a whitish streak.

*Schistus compactissimus*. *Syst. nat.* xii. 3. p. 39. n. 13.

Found very rarely in *China*; black or brown, exteriorly glabrous and unequal, internally very compact.

*atrata*. Of a lamellar slaty texture, very soft, making a whitish streak.

*Schistus scriptura alba*. *Syst. nat.* xii. 3. p. 37. n. 3.

*Schistus diverso colore*. *Wall. syst. min.* 1. p. 341. n. 6. a. c. e.

Found in *Lapland*, and various provinces of *Sweden*: meagre, blackish, brown, or yellowish, crackling when stirred in the fire, and running into a frothy kind of glass in a greater degree of heat, effervescing a little with nitric acid when powdered.

*undulata*. Black, of an undulately slaty texture.

*Schistus carbonarius*. *Wall. syst.* 1. p. 345. n. 9. d.

Found in *Finland* and *Fennia*, sometimes softer and melting into porous slags, sometimes a little harder and melting into a solid glass.

*bituminosa*. Very soft, a little greasy, of a dull colour, shining when rubbed, leaving a black streak, of a straight slaty texture, breaking into discoid fragments, smoking or flaming in the fire, becoming paler in the fire.

*Brandschiefer*. *Cronst. miner. sect.* 159.

*Bituminous schistus*. *Schmeisser mineral.* 1. p. 170.

2. *Schistus solidus crassus*. *Wall. syst.* 1. p. 344. n. 9. b, c.

3. *Schistus communis*. *Syst. nat.* xii. 3. p. 39. n. 10.

*Schistus niger pinguis*. *Wall. syst.* 1. p. 340. n. 5.

4. Kolon. *Gronst. mineral. sect.* 158.

Found in *Britain*, *Sweden*, and *Lusatia*, forming large beds in stratified mountains, and is strongly impregnated with bitumen and sulphur pyrites: colour generally black, a little glittering when broken: when exposed to heat it smokes or flames, emits a bituminous odour, and becomes paler after losing its bitumen.

*Kellas*, Of a fibrous texture, slightly adhering to the tongue.

*Killas* *Kirwan mineral.* 1. p. 237.

Found in *Cornwall*, of a pale blueish-grey, red, or whitish-yellow colour, and often intersected with veins of copper or tin: surface undulated: fracture long, splintery, imperfectly flaty: lustre opaque, silky: contains silica 0,60. argil 0,25. magnesia 0,09. iron 0,06. and some petrol or bitumen. *Kirwan*.

*Nigrica*, Deep black, meagre, very soft, soiling the fingers, making a black streak, of an incurved flaty texture, breaking into discoid fragments or long splinters, becoming reddish-grey in the fire.

*Schistus scriptura atra.* *Syst. nat.* xii. 3. p. 38. n. 9.

*Schistus mollis niger.* *Wall. syst.* 1. p. 343. n. 8.

Black chalk. *Kirwan mineral.* 1. p. 195.

Black chalk. *Schmeisser miner.* 1. p. 173. *Thomf.* 3. p. 538.

Found in *Westgoth*, *Franconia*, and *Italy*, in solid masses, without lustre: adheres slightly to the tongue, feels smooth, assumes a polish from a knife, gives a black streak and marks black, does not readily moulder in water, or effervesce or dissolve in acids, when heated to redness becomes reddish-grey: contains silica 64,60. alumina 11,25. charcoal 11,00. oxyde of iron 2,75. water 7,50. *Weigleb*.

*tessularis*. Very soft, somewhat ponderous, breaking into trapezoid fragments, of a flaty texture.

*Schistus rhombeus.* *Gerb. Beytr. min.* 1. p. 343. n. 5.

Found in *Silesia* near *Goldberg* and *Neudorf*, forming entire mountains, of a brown, pale yellow, or green colour.

36. **BASALTES.** Consisting of a large proportion of silica, with a lesser proportion of alumina and oxyde of iron, and often a little lime, magnesia, oxyde of manganese and soda: opaque, inconspicuous, meagre, generally becoming greyish when rubbed with a knife, breaking into indeterminate fragments, mouldering in the air into argil: not effervescing with nitric acid, melting before the blow-pipe into a black glass attracted by the magnet.

*schistosus.* Black, of a slaty texture,

Found in basaltine mountains on the Rhine, and in the neighbourhood of Göttingen, commonly abounding in particles of Olivin.

*columnaris.* Of a dull colour, compact, hardish, tenacious, spontaneously breaking into prismatic granular fragments.

Basaltes. *Baum. miner.* 1. p. 220.

Basaltes figura columnari. *Wall. syst.* 1. p. 319. n. 9.

Figurate Trap, Basalt. *Kirwan miner.* 1. p. 231.

Basalt. *Schmeisser min.* 1. p. 185. *Thomson's chem.* 3. p. 575.

Found in various parts of the *British Islands*, particularly in *Staffa* in *Scotland*, and the *Giant's Causeway* in *Ireland*, in the *South Sea Islands*, *Sicily*, *Italy*, *France*, and many parts of *Europe*, generally forming the base of mountains, of a columnar shape, straight or curved, perpendicular or inclined, rarely parallel; the diameter of the columns from 3 inches to 3 feet, sometimes with transverse semispherical joints, in which the convexity of one is inserted into the concavity of the other; their form is pentangular, hexangular, or octangular, rarely triangular, or quadrangular: colour blueish or greenish-black, or dark greyish blue, variously intersected with veins of white calcareous spar, and often the impressions of various fossil bodies and shrubs: they are rather hard and difficult to break, feel harsh, and sound under the hammer: texture earthy: fracture uneven; streak ashy-grey: specific gravity from 2,864. to 3,000. a specimen from *Staffa* contained silica 44. alumina 16. oxyde of iron 16. lime 9. water 5. soda 4. muriatic acid 1. *Kennedy.*

*pyramidalis.* Of a dull colour, compact, spontaneously falling into pyramidal fragments.

*Hacquet Chem. Journ.* 1788. 1. p. 522.

Found in the mountains of *Bohemia*, near *Aussig*, in elongated 3-sided fragments; and in *Hungary*, near *Schemnitz* and *Cremnitz*, in 4-sided fragments.



*unicatus*. Compact, spontaneously falling into crustose fragments; the crusts spherical and concentric.  
Found with the *B. columnaris*; is a little softer, with a paler tinge, and crumbles more easily.

*Wacca*. Soft, fragile, compact, a little glossy when rubbed, not falling spontaneously into fragments.

Wacken. *Kirwan*. 1. p. 223. *Thomson chem.* 3. p. 577.

Wacke. *Schweiff. mineral.* 1. p. 318.

Found in the mountains of *Bohemia* and *Saxony*, sometimes in entire strata, sometimes in thin layers under or between basalt; colour cinereous, or greenish, or blackish, or yellowish, and often contains veins of metallic ores: lustre none, fracture even, texture earthy, opaque, soft, easily broken, and feels slightly greasy: it withers by exposure to the atmosphere, and then becomes more grey: frequently contains black mica, but never olivin.

*Trapezum*. Hardish, compact, imbibing water, growing reddish in the air and mouldering into lamellar pieces, crackling and breaking with explosion in the fire.

Saxum impalpabile. *Syst. nat.* xii. 3. p. 72. n. 3.

Corneus durus. *Wall. syst. min.* 1. p. 361. n. 4.

Trap. *Kirwan miner.* 1. p. 227. *Thomson chem.* 4. p. 134.

Trapp. *Schweiffer mineral.* 1. p. 183.

1. Toadstone. *Kirwan*, 1. p. 229.

Of a dark brownish-grey colour, abounding with cavities filled with crystallized carbonate of lime, which from the destruction or decomposition of the crystals are often empty: contains silica 0,63. alumina 0,14. mild carbonate of lime 0,07. oxyde of iron 0,16. *Withering*.

2. Rowley ragg, or Turillite. *Kirwan*. 1. p. 229.

Of a black colour with numerous white dots, and black lamellæ of basaltine, which give it a dark brownish-grey appearance: found in large masses, affecting a rhomboidal form, inclosing rounded pebbles of the same substance: acquiring an ochry crust by exposure to the air, and shining internally from a number of minute particles: heated in the open air it becomes magnetic, and loses about 3 per cent. of its weight: it does not redden in the fire, but at 98°. melts into a porous black mass, partly porcelain, partly enamel: fracture nearly even, fine splintery, often inclining to the conchoidal: contains silica 475. alumina 325. oxyde of iron 200. *Withering*.

3. Whin-stone. *Kirwan miner.* 1. p. 230.

Of a blue or greyish-black colour, and rather hard: found in detached fragments, or forming dykes in mines.

Found in the mountains of *Britain*, *Scandinavia*, *Switzerland*

and Germany, forming vast masses, and often broken into 3, 4, or 5-sided prisms: colour greyish, blueish or purplish-black, black, blackish or reddish-brown, and frequently containing basaltine, quartz, crystallized carbonate of lime, feldspar, and olivin; hence it is frequently porous, cellular or cavernous, from the decomposition or falling out of these stones: fracture earthy or fine splintery, often uneven: it effervesces a little with acids, and may be melted into blackish-green glass.

37. LAVA. Consisting of alumina, with a larger portion of silica and oxyde of iron, and frequently a little carbonate of lime and carbonate of magnesia: generally of a dull colour, becoming hoary when scraped, meagre, breaking into indeterminate fragments, mouldering into argill in the air: produced by the internal fires of volcanic mountains from which it is thrown out, and melting again into a black glass.

*compacta.* Nearly opaque, compact, hardish, of a conchoidal texture.

Compact Lava. *Kirwan mineral.* 1. p. 404.

Compact Lava. *Schmeisser.* 1. p. 189. *Thomson.* 4. p. 147.

Found in volcanic mountains and their neighbourhood, appearing to have been fused by the action of fire, but not vitrified, and becoming when cooled, compact, close, and solid, and bearing the resemblance of its original mineral: colour generally blackish, sometimes grey, brown, or red, rarely white, very rarely green or blue: its substance is so very little porous as to admit being cut into slabs with an almost entire surface, and polished like marble; fracture earthy or fine splintery, more rarely foliated: contains often hornblend, white garnets, olivin, calcareous spar, mica, shorl, &c.

*vitrea.* Diaphanous, shining, compact, hard, of a conchoidal texture.

Pumex vitreus. *Syst. nat.* xii. 3. p. 182. n. 7.

Porus igneus vitreus. *Wall. syst.* 2. p. 387. n. 5.

Vitreous Lava. *Schmeisser mineral.* 1. p. 189. *Kirwan* 1. p. 401.

Compact glass. *Thomson chem.* 4. p. 150.

2. Lava with glassy filaments.

*Hamil. Phil. Transf.* 1780. vol. 70. part 1. n. 4.

Found about volcanic mountains in *New Spain, Peru, Hecla, Vesuvius*, and sometimes in places where subterraneous fires have taken place either from pyrites or in coal-pits: contains generally other substances imbedded, and is more or less

transparent: colour generally black, rarely cinereous, greenish, blueish, or white, sometimes prismatic: usually of a common, rarely of a stalactitical globular or pyramidal form: melts with more difficulty than other species, on account of its containing less iron, carbonate of lime and magnesia: is frequently so hard as to strike fire with steel.

*scoriacea.* Vesicular, rough, shining internally, of a conchoidal texture.

Volcanic scoria and slaggs. *Kirwan miner.* 1. p. 402.

Spongy Lava. *Schmeisser miner.* 1. p. 189.

Scoria. *Thomson chem.* 4. p. 149.

Porus igneus lapideus. *Wall. syst.* 2. p. 227. n. 3. b.

Found in streams of volcanic lava, generally covering the Lava compacta, black or brown, with often a mixture of heterogeneous matters: the surface appears full of empty bubbles, often disposed in an undulate manner.

*porosa.* Opake, without lustre, porous, lightish.

Cellular Lava. *Kirwan mineral.* 1. p. 403.

Porous Lava. *Schmeisser mineral.* 1. p. 189.

Porous Lava. *Thomson chem.* 4. p. 149.

Found in volcanic mountains and their neighbourhood, more rarely in those which have been extinguished, and seems rather to have been thrown from the crater than run over at the sides: colour black or brown, sometimes reddish-brown: it probably contains more carbonate of magnesia than the rest, and is more subject to destruction than compact lava: its pores are larger near the surface than towards the centre.

*Pumex.* Opake, without lustre, parallel, fibrous, porous, light, rough.

Pumex vulcani. *Syst. nat.* xii. 3. p. 181. n. 1.

Porus igneus lapideus. *Wall. syst.* 2. p. 375. n. 2.

Pumice. *Kirwan miner.* 1. p. 415. *Thomson Chem.* 3. p. 149.

Pumice-stone. *Schmeisser mineral.* 1. p. 188. 341.

1. Fibrous, with elongated pores. *Kirwan. var.* 1.

2. Pores very minute, hardly fibrous. *Kirwan. var.* 2.

Found in the ashes of most volcanic mountains, from whence it is washed down into the sea: colour grey, greyish-white, brown, or reddish, rarely yellowish: the fibres are generally parallel, more or less discernible, and have a silky lustre: does not effervesce with acids, melts into a white enamel: contains silica 77,50. alumina 17,50. oxyde of iron 1,75. soda of potash 3,00. *Klaproth.*

*purca.* Originating from substances which have been ignited by burning strata of fossil coals.

Found in *Bohemia* near *Belin*, *Seidschütz*, *Laun*, and *Lobosun*, in *Wassovia* near *Datsweiler*, in *Hungary* on mount *Schater*, porous or compact, more or less ponderous, of a reddish, cinereous, black, blue, iron, steel or iridescent colour.

38. MICA. Consisting of silica and alumina, with a small proportion of oxyde of iron, and generally a little magnesia and lime: glabrous, meagre, shining, spontaneously falling into granular fragments, easily breaking into discoid fragments, lightish, parasitical: fusible before the blow-pipe into a white or coloured enamel.

*membranacea.* Transparent, with large parallel elastic easily separable plates.

Mica membranacea. *Syst. nat.* xii. 3. p. 58. n. 1.

Mica membranacea. *Wall. syst. min.* 1. p. 369. n. 1.

Mica, Muscovy talc. *Kirwan mineral.* 1. p. 210.

Mica, Glitt. *Schmeisser miner.* 1. p. 176.

Mica. *Thomson chem.* 3. p. 539.

Found in *Malabar*, *Siberia*, *Russia*, *Finland*, *France*, and near *Geneva*, in large plates which are often substituted for glass, and consists of a great number of thin transparent laminæ adhering together: these are readily distinguished from the layers of *Gypsum speculare* and *glaciale*, from their great degree of flexibility: texture foliated: fragments flat: lustre metallic: very tough: often absorbs water: feels smooth, but not greasy: specific gravity from 2,6546. to 2,9342. contains silica 50,00. alumina 35,00. oxyde of iron 7,00. magnesia 1,35. lime 1,33. *Vauquelin*:

*laminosa.* Transparent, coloured, with large parallel easily separable plates.

Mica membr. fissilis. *Syst. nat.* xii. 3. p. 58. n. 2.

Mica membran. semipelluc. *Wall. syst.* 1. p. 369. n. 2.

Found principally in the granites of primeval mountains, generally smoke-colour or black, sometimes brown, gold, red, or white, and very rarely concreted in masses resembling pieces of Shale.

*squamosa.* Somewhat opake, with lesser scattered incurved foliations.

1. Of a silvery colour.

Mica squamosa argentea. *Syst. nat.* xii. 3. p. 58 n. 3.

2. Of a gold colour.

Mica squamosa aurata. *Syst. nat.* xii. 3. p. 58. n. 4.

Found every where in Granite and other stones, intermixed among their component parts, in almost innumerable hues and colours, but generally with a coppery silvery or gold metallic lustre,

*undulata.*

With undulate gold foliations.

Mica flexuo-undulata. *Syst. nat.* xii. 3. p. 60. n. 10.

Mica fililis. *Wall. syst. min.* 1. p. 372. n. 4. b, c.

2. With flexuous brittle gold foliations.

Mica Hungarica. *Syst. nat.* xii. 3. p. 59. n. 6.

Talcum luteum. *Wall. syst. min.* 1. p. 375. n. 9.

Found in the mines of *Dalecarlia*.

*hemisphæ-  
rica.*

With hemispherical concentric foliations.

Mica squamis hemisph. *Syst. nat.* xii. 3. p. 59. n. 8.

Mica hemispherica. *Waller syst.* 1. p. 373. n. 6.

Found in *Finland*, in the haralet *Kimito*, constituting a component part of decaying rock, white, very shining, and resembling in bulk and figure the half of a split pea.

*striata.*

With the foliations radiating.

Mica partic. oblong. *Wall. syst. min.* 1. p. 372. n. 5.

Found in *Saxony*, in stones, cinereous or black, becoming whitish or yellowish in the fire, and approaching near to a hornblend.

*crystallina.* In six-sided tables.

Mica squamis erectis. *Syst. nat.* xii. 3. p. 60. n. 9.

Mica figura determinat. *Wall. syst.* 1. p. 373. n. 7.

Found in the mines of *Dalecarlia*, in *Salsburg* and *Zinnwalden*; the tables sometimes scattered, sometimes aggregate in a stellate manner, or disposed in columns.

*prismatica.* Brown, in 9-sided prisms.

*Klaproth Berg. Journ.* 1790. 9. p. 227.

*Hoffm. Berg. Journ.* 1789. 1. p. 156.

Found in the mines of *Saxony*, near *Schneeberg*, in rock composed of quartz and feldspar, opaque, a little shining within.

*Lepidolite-  
thus.*

With scattered, flat, cohering, pale violet scales.

Lepidolite, Lilalite. *Kirwan mineral.* 1. p. 208.

Lepidolite, Lilalite. *Thomson chem.* 3. p. 511.

Found in *Moravia* and *Sudermania*, mixed with granite in large amorphous masses, and is composed of thin plates which separate easily: colour of the mass violet blue, of the thin plates silvery white: powder white with a pale red tinge: before the blow-pipe it froths, and melts easily into a white semitransparent enamel full of bubbles: dissolves in borax

with effervescence, and communicates no colour to it: effervesces slightly with soda, and melts into a mass spotted with red: with microcosmic salt, it gives a pearl-colour globule: contains silica 53. alumina 20. potash 18. float of lime 5. oxyde of manganese 3. oxyde of iron 1. *Klaproth.*

39. OPALUS. Consisting of alumina, the greater proportion of silica, with a little oxyde of iron, and generally some carbonate of magnesia and carbonate of lime: hardish, shining, hardly ever opake, of a conchoidal texture, light, breaking into indeterminate fragments, parasitical, generally of a common form, easily cracking into clefts: melting with the greatest difficulty.

*Hydrophanus.* Somewhat opake, becoming transparent and changing its colour in liquids, adhering to the tongue.

Achates unguium colore. *Syst. nat.* xii. 3. p. 69. n. 6. d.

Achates, &c. *Wall. syst. min.* 1. p. 283. n. 21.

Hydrophane. *Kirwan mineral.* 1. p. 295.

Oculus mundi, Hydrophan. *Schmeisser mineral.* 1. p. 141.

Hydrophane, Oculus mundi. *Thomson chem.* 3. p. 523.

Found in the *Feroe islands*, *Iceland*, *Britanny*, *Hungary*, *Silesia*, and *Germany*, generally accompanying other stones of the genus, or in the state of incrustation in contact with Opal, Chalcedony, Prase, Chrysoprase, Serpentine, Granite, Nephrite, Jasper, Porphyry, and indurated Clay: colour white, yellow, red, or green: becomes gradually transparent when soaked in water by imbibing the liquid, and is sometimes, though rarely, found in the form of a 3-sided pyramid: contains silica 93. alumina 1 or 2. water, inflammable matter and air 5, with sometimes a little iron.

*piceus.*

Of a waxy lustre, and imperfectly conchoidal texture.

Pitchstone. *Kirwan* 1. p. 292. *Schmeisser miner.* 1. p. 145.

Pitchstone. *Thomson chem.* 3. p. 529.

Found in amorphous masses of various size, in *France*, *Germany*, *Saxony*, and various parts of *Europe*, and in *New Spain*: colour greyish-black, greenish-brown, blueish grey, leek or olive-green, red or yellowish, transparent, semitransparent or opake, frequently presenting large or small grained distinct concretions: lustre a little greasy: specific gravity from 2,314. to 2,645. contains silica 73,00 alumina 14,50. lime 1,00. oxyde of iron 1,00 oxyde of manganese 0,10. soda 1,75. water 8,50. *Klaproth.*

*ligneus.* Nearly opaque, breaking longitudinally into fibrous fractures, spontaneously falling into crustose fragments.

Ligniform Opal. *Kirwan mineral.* 1. p. 295.

Wood Opal. *Schmeissner miner.* 1. p. 145.

Wood Opal. *Thomson chem.* 3. p. 524.

Found in *Hungary*, in large masses which have the form of wood, of a milk reddish or yellowish-white, brown, or hyacinth colour: has a shining surface, and is generally semitransparent on the edges: fracture when broken transversely conchoidal, when broken longitudinally exhibiting the texture of wood: is very brittle, and considered as fragments of wood impregnated with semiopal.

*serenus.* Semitransparent, light, yellow, of a perfectly conchoidal texture.

*Werner Cronst. mineral.* 55 p. 121.

Found in *Poland* and *Hungary*, in rounded fragments, and often imbedded in jasper and indurated clay: its colour is sometimes a waxen, sometimes a honey-yellow, frequently verging to brown: it is brittle, shining very much internally, and breaks into acute and often nearly discoid fragments.

*philigr.* Hard, lightish, easily breaking into acute fragments.

Semi Opal. *Kirwan mineral.* 1. p. 290.

Half Opal. *Schmeissner mineral.* 1. p. 144.

Semi-opal, Menilites. *Thomson chem.* 3. p. 523.

Found in *Poland*, *Bohemia*, *Hungary*, *Austria*, *Saxony* and *Germany*: colour various shades of white, grey, yellow, red, brown, often mixed together: diaphanous, or opaque, rarely transparent: texture more or less perfectly conchaceous, and its lustre more or less glassy: is very brittle, and sometimes adheres to the tongue: specific gravity 2,540. contains silica 85,5. oxide of iron 0,5. water 11,0. alumina 1,0. lime 0,3. *Klaproth.*

*vulgaris.* Reflecting a different colour according to its position as to light, hardish, lightish, diaphanous, breaking into rather obtuse fragments.

Silex vagus. *Syst. nat.* xii. 3. p. 63. n. 6. a.

Achates fere pellucida. *Wall syst.* 1. p. 280. n. 19.

Vulgar Opal. *Kirwan mineral.* 1. p. 289.

Common Opal. *Schmeissner miner.* 1. p. 141.

Common Opal. *Thomson chem.* 3. p. 522.

Found in *Poland*, *Silesia*, *Saxony*, *Hungary*, and *Germany*, usually imbedded in other stones, of a common form, rarely kidney-form or botryoidal, shining a little internally, generally tub-opaque: colour white, yellow, red, green of various mixtures:

sometimes it is found inclosing a drop of water: reflects a single colour when held between the eye and the light: it often cracks and becomes decomposed by exposure to the atmosphere: contains silica 98,75. oxyde of iron 0,1. alumina 0,1. with often a little water, *Klaproth*.

*nobilis.*

Semitransparent, shining very much internally, light, hardish, reflecting various bright colours according to its position as to light: breaking into acute fragments.

Opalus Pædorata- *Syst. nat.* xii. 3. p. 68. n. 6. b.

Opalus colore olivari. *Wall. syst.* 1. p. 281. n. 19. b.

Opal Edler. *Kirwan. miner.* 1. p. 289.

Real Opal. *Schmeisser miner.* 1. p. 141.

Noble Opal. *Thomson chem.* 3. p. 522.

Found at the foot of the *Carpathian mountains*, and in *Hungary*, in solid pieces, and sometimes incorporated in other stones: colour various, the white often reflecting a yellowish, greenish-greenish or reddish effulgence resembling a flame, when placed between the eye and the light, the yellow a fiery, and the green a purple red or yellow: when heated it becomes opaque, and is sometimes decomposed by exposure to the atmosphere: specific gravity 2,114. contains silica 90. water 10. *Klaproth*.

40. ZEOLITHUS. Consisting of a little alumina, and a large proportion of silica, with frequently a little carbonate of lime, and a small quantity of oxyde of iron and water: lightish, generally breaking into indeterminate fragments, parasitical, falling spontaneously into granular fragments: soluble in nitric acid without effervescence, and often forming with it a gelatinous mass, easily frothing before the blow-pipe and emitting a phosphorescent light, and melting into a white semitransparent enamel.

*farinaceus.* White, friable.

*Knock Beytr. chem. ann.* 2. p. 20-

Found in *Iceland* and *Hercynia*, and formed by the decomposition and decay of other species of its genus.

*lamellosus.* Solid, shining internally, white with often a shade of red, diaphanous, lamellar, with the foliations undulate and brittle.



Stilbite. *Thomson chem.* 3. p. 565.

Zeolite. *Schmeijer mineral.* 1. p. 148.

Lamellar Zeolite. *Werner mineral.*

Found in *Ostrogoth* and *Iceland*, sometimes breaking into crustose fragments, and is rather hard.

*radiatus.* Solid, shining like mother of pearl; radiate with the rays convergent.

Crystalli Zeolit. pyram. *Cronst. min.* 111. 3. A.

Zeolites facie selenitica. *Wall. syst.* 1. p. 313. n. 9.

Found in *Iceland*; on the *Feroe islands*, *Lapland*, *Fennia*; and *Hercynia*: colour white or yellow, hardish, with the rays sometimes fascicled, sometimes stellate.

*fibrosus.* Solid, shining like mother of pearl, fibrous with the fibres convergent.

Zeolites spatiosus. *Cronst. min.* 110.

Zeolites partic. minor. *Wall. syst.* 1. p. 311. n. 2.

Zeolite. *Kirwan miner.* 1. p. 278.

Zeolite. *Thomson chem.* 3. p. 564.

Mesotype. *Hauy.* 111. 151.

Found in *Scotland*, and various parts of *Europe* in Basaltes; and in the lavas of *Iceland*, often accompanied with Chalcedony, rarely in *Hercynia*: colour white, reddish, brownish, yellow, or cinereous: lustre silky or pearly: refracts double, and absorbs water: when heated it becomes electric: before the blowpipe it froths, emits a phosphorescent light, and melts into a white semitransparent enamel soluble in acids: dissolves slowly in acids, without effervescence, and is converted at last into a jelly: the fibres are sometimes fascicled, sometimes stellate and aggregate into a more or less perfectly globular form: specific gravity 2,0833. contains silica 53,00. alumina 27,00. lime 9,46. water 10,00. *Vauquelin.*

*stellatus.* Solid, somewhat cylindrical, reddish.

Stalactites Zeolithus. *Syst. nat.* xii. 3. p. 185. n. 12.

Found in the clefts of rocks, and is probably hardly a distinct species.

*clavatus.* Solid, transparent, shining like mother of pearl, grooved, of a clavate form.

*Knock. Beytr. chem. annal.* 2. p. 17. f. 6--8.

Found in clusters in the *Feroe Islands*, *Iceland*, *Fennia* and *Hercynia*, on the *Argentum rubrum* and various species of *Spatum*: colour milk-white, rarely yellowish.

*tabularis.* Solid, semitransparent, hardish, shining like mother of pearl, in 6-sided tables.

*Knock. Beytr. chem. annal.* 2. p. 16. f. 1. 3. 4. 5.

Found in *Iceland*, *Hercynia*, and *Transylvania*: colour mostly bluish-white, more rarely milk-white or red: the shorter faces generally terminating each in two rhombs.

*cubicus*. White, solid, somewhat pellucid, hardish, shining like mother of pearl, in minute aggregate cubes.

Found in the *Feroe Islands*, *Iceland*, and among the *Basalt*es on mount *Laufseke* in upper *Lusatia*.

*prismaticus*. White, pellucid, shining, hardish, in 4-sided prisms.

1. With the prisms rectangular.

a. With the prisms perfect.

*Crytalli Zeolitis distincta*. *Cronst. min.* 111. B.

b. With the prisms terminating in a point at each end.

*Knock. Beyr. chem. annal.* 2. p. 133.

c. With the prisms terminating in a 3-sided pyramid.

*Karsten Leske mineral.* 1. p. 133.

d. The prisms equilateral.

e. The prisms compressed.

*Karsten Leske mineral.* 1. p. 233.

f. The pyramids compressed and perforating themselves cross-wise.

g. The prisms aggregate,  
In a fasciculate manner.  
In a stellate manner.

2. With the prisms obliquangled.

Found in the *Feroe Islands*, *Iceland*, *Hercynia*, and *Fennia*: the prisms are commonly very small.

*capillaris*. Snow-white, shining, hardish, in capillary pyramids.

1. With the pyramids distinct.

2. With the pyramids clustered in a fascicled manner.

*Crytalli Zeolitis capillaris*. *Cronst. min.* 111. C.

*scintillans*. Hard, shining.

1. Of a common form.

2. With the surfaces spherical.

3. In perfect 6-sided prisms, with convex faces.

Found in *Scotland*, near *Edinburg*, *Dumbarton*, and *Strontian*, in *Basalt*es, in *Sweden* near *Edelsfors*, and in *Wesiroeth*; most commonly compact, rarely fibrous or radiate: colour white, grey, isabelline or red, and admits a fine polish.

*viridis.*

Apple-green, hard, semipellucid, of a partly foliated partly radiate texture.

Krytall Präf. *Hacq. Berl. Naturf.* 4. p. 25. t. 3. f. 17.

Phrenite. *Kirwan miner.* 1. p. 274.

Phrenit. *Schmeißer miner.* 1. p. 147.

Phrenite. *Thomson chem.* 3. p. 567.

1. Of a common form.

2. In the form of a 4-sided compressed prism.

Found near *Dumbarton* and other places in *Scotland*, at the *Cape of Good Hope*, and in *Dauphigny*, sometimes so hard as to strike fire with steel, and to admit a fine polish: colour apple-green, sometimes verging into leek or olive-green: the crystals are in groups and confused, and appear, according to *Haüy*, to be 4-sided prisms with dihedral summits; sometimes they are irregular 6-sided plates, and sometimes flat rhomboidal parallelepipeds: the amorphous kind presents either a foliated or striated texture; the foliated consisting of large or small-grained distinct concretions, the striated of imperfect slender columnar concretions: the transverse fracture is uneven and fine grained: before the blowpipe it foams and swells more than other species, and melts into a brown enamel, smooth on the outside, but spongy and porous underneath: specific gravity 2,6097. to 2,6996. contains silica 43,83 alumina 30,53. lime 18,33. oxyde of iron 5,66. air and water 1,16. *Klaproth*.

*columnaris.*

Prismatic, transversely striate, of a fibrous texture when broken longitudinally, of a lamellar texture when broken transversely.

*Fichtel & Bindheim Schr. Berl. Naturf.* 3. p. 447. 452.

Found in *Transylvania* near *Schebesch*, mixed scatteredly with the *Marmor micans*: the prisms sometimes solitary, sometimes clustered, 4-sided or 6-sided: colour generally white, rarely bluish, sea-green, or straw-colour: contain a larger proportion of carbonate of lime than other species, to the quantity of 13 parts out of 60, and less alumina.

*cyaneæ.*

Very brittle, transparent, shining, ponderous, hardish, striking fire with steel, breaking transversely into long splinters, texture foliated in a radiate manner.

Cyanit. *Werner Bergm. Journ.* 1790. 1. p. 164.

Sappare. *Saussure Journ. Phys.* 1789. *Mart.* p. 213.

Sappare. *Kirwan miner.* 1. p. 209.

Disthine. *Haüy* 111. p. 220.

Cyanit. *Schmeißer miner.* 1. p. 178.

Cyanite. *Thomson chem.* 3. p. 579.

Found in *Scotland*, on the *Carpathian* mountains, on *St. Gothards* in *Switzerland*, near *Lyons*, in *Siberia*, *Transylvania* and at *Zitterthal* in *Tyrol*, generally in Granite and Gneiss rocks: colour white with shades of sky or Prussian blue, sometimes bluish-grey or yellowish-grey streaked with azure or deep blue, often in spots reflecting a silvery white: found in distinct lamellar concretions, which are in part accumulated in grains, and feels somewhat greasy: texture foliated; fracture radiated, with the rays curved and interlaced: the surface is longitudinally striate: the primitive form of its crystals is a 4-sided oblique prism, but is sometimes crystallized in 6-sided prisms: before the blowpipe it becomes almost perfectly white, but does not melt: specific gravity from 3,517. to 3,622. contains alumina 66,92. magnesia 13,25. silica 12,81. iron 5,48. lime 1,71. *Saußure*.

*conglomeratus.* Falling into granulations which are levigated of a glassy lustre, and concentrically crufted.

*Fichtel Karpath. p. 395. 648.*

Found in the mountains of *Hungary*, in large masses, generally laced with veins of Jasper.

*combustus.* Porous.

*Fichtel karpath. p. 357. 647. 653.*

Found on mount *Schatos* in *Hungary*, whitish or blackish, and may probably have its origin from liquified Granite.

*quartzosus.* Blackish, of an equal texture, breaking into acute fragments, of a greasy lustre.

*Fichtel karpath. p. 652.*

Found near *Talkobanga* in *Hungary*, where it constitutes an entire mountain.

*varius.* Of a glassy texture and greasy lustre, blackish, consisting of white immersed granulations.

*Fichtel. Beitr. p. 657.*

Found near *Glasbaffe* in *Hungary*, and is probably not of this genus.

*argenteus.* Diaphanous, full of cracks, of a silvery colour.

Found near *Peklin* in *Hungary*.

*bohemicus.* Lamellar, not effervescing in the fire, but running into a diaphanous glass.

Found in *Bohemia* near *Kunyetitz*, imbedded in *Amnygdalite*.

41. SCORLUS. Consisting of alumina and silica, mostly oxyde of iron, with frequently a little carbonate of magnesia and oxyde of manganese: hard, breaking into indeterminate fragments, shining internally, parasitical: not effervescing with nitric acid, and easily melting into a glass.

*granatinus*. White, hardish, fusible in the fire with some difficulty, easily mouldering.

Graniti vianchi. *Giuvani lotolog. Vesuv. p. 38.*

Bergman de prod. vulcan. opusc. vol. 3. p. 206.

Schorl, Basaltine, White Garnets. *Kirwan 1. p. 285. 426.*

Volcanic Schorl. *Schmeisser miner. 1. p. 85.*

Leucite. *Thomson chem. 1. p. 552.*

Found in the Lavas of *Vesuvius*, where it appears, according to *Kirwan*, to have pre-existed in the rocks which were the mother stones or basis of lavas before the eruption, and is not formed by subsequent percolation through, and crystallization in the melted lava: colour white or greyish-white: it is always found in crystals, the primitive form of which are either cubes or rhomboidal dodecahedrons: texture foliated: fracture more or less conchoidal: it is sometimes transparent, but opaque when decomposing: its powder causes syrup of violets to assume a green colour: is hardly fusible before the blowpipe, and gives a white transparent glass with borax: specific gravity from 2,455. to 2,490. contains silica 54. alumina 23. potash 22. iron 0. *Klaproth.*

*vitreus*.

Brittle, shining, of a minutely conchoidal texture, easily melting before the blowpipe with froth into a hard black enamel.

Thunerstone. *Kirwan miner. 1. p. 273.*

Thunerstone, Purple brown Schorl. *Schmeisser 1. p. 86.*

Thummerstone. *Thomson chem. 3. p. 596.*

1. Of a common form, diaphanous or subopaque, spontaneously taking into crustose fragments.
2. In very shining pellucid or semipellucid crystals which are somewhat prismatic, with rhomboidal faces, generally striated longitudinally,

Found near *Therm* and *Schneeberg* in *Saxony*, near *Bourg de Oisans* in *Dauphiné*, in the *Pyrenean* mountains, and in *Norway* near *Kongsburg*: colour clove-brown, sometimes inclining to red, green, grey, violet or black: is generally found in crystals, the most usual of which are flat rhomboidal parallelepipeds with the opposite edges a little truncated; the

faces generally streaked longitudinally, except where truncated: specific gravity 3.2956. contains silica 52.7. alumina 25.6. lime 9.4. oxyde of iron 9.6. with a small trace of manganese. *Klaproth*.

*tabularis*. Hoary, semipellucid, consisting of very thin 4-sided tables compacted into thicker ones.

*Hoffmann Berg. Journ.* 1788 1. p. 57.

Found near *Bourg de Oisans* in *Dauphiné*, with the last species: compact, a little polished, and somewhat shining internally, of a rather plan- texture: the lateral faces of the tables cylindrico-concave, the terminal ones generally slightly convex.

*Vesuvianus*. Diaphanous, fulvous, in 6-sided prismatic crystals.

Hyacinthine. *La Metherie Journ. phys* 1792. Nov. p. 356.

Vesuvian. *Thomson chem.* 3. p. 599.

Found scatteredly in the lavas of *Vesuvius*, and was formerly confounded with the Hyacinth: colour fulvous-brown or greenish: is sometimes found crystallized in rectangular 8-sided prisms, or rather 4-sided prisms with their edges truncate: the primitive form of its crystals is the cube: scratches glass: internal lustre 2, greasy; external 4, glassy: fracture imperfectly conchoidal: causes double refraction: melts before the blowpipe into a yellowish glass: specific gravity from 3.39. to 3.409. contains silica 26.5. magnesia 40.2. oxyde of iron 16.2. lime 16.0. *Stucke*.

*genuinus*. Ponderous, opaque, making a pale grey scratch.

Borax lapidosus. *Syst. nat.* xii. 3. p. 95. n. 3.

Corneus crystallizatus *Wall. min. sp.* 139.

Basalt. fig. column. *Wall. syst.* 1. p. 319. n. 2.

Shorl. *Kirwan. mineral.* 1. p. 265.

Turmalin from Brasil. *Schmeisser mineral.* 1. p. 78.

Black Shorl. *Thomson chem* 3. p. 545.

Found in *Cornwall*, where it is known under the name of *Cockle*, in *Ceylon*, *Madagascar*, *Spain*, *Italy*, *Switzerland*, *France*, *Hungary*, *Saxony*, &c. in mass, disseminated and crystallized, generally in Granite, Gneiss, and other similar rocks: the crystals are 3 or 6 sided prisms, which when entire are terminated by 3 sided pyramids; the surface of the crystals longitudinally streaked: the amorphous kind presents thin straight distinct columnar concretions, sometimes parallel, sometimes divergent or stellate, streaked. and easily separable from each other; very seldom in granular concretions: the surface can be scratched with a hard knife, and when heated or rubbed hard is a little electric: when heated to redness it becomes reddish-brown: is often so rich in iron, as to be attracted by the magnet: is acted upon by

nitric acid, and before the blowpipe melts into a brownish compact enamel: specific gravity from 3,054. to 3,092. contains alumina 41,25. silica 34,16. iron 20,00. manganese 5,41. *Weigleb.*

2. In regular 12-sided crystals, with the margins generally truncate.

Zeylanites. *La Methiere Journ. Phys.* 1792. Aug. p. 156.

Ceylanite. *Thomson chem.* 3 p. 515.

Pleonaste. *Haüy miner.* 3 p. 17.

Found in Ceylon, sometimes in rounded masses, generally opaque, except when in very thin pieces: fracture conchoidal: internal lustre glassy: colour of the mass black, of very thin pieces green, red, dusky yellow, or blueish: powder greenish-grey: specific gravity from 3,7647. to 3,793. contains alumina 68. oxyde of iron 16. magnesia 12. silica 2. *Descotils.*

*electricus.*

When heated to 200° of Fahrenheit, attracting light bodies by one end, and repelling them by the other.

Borax diaphanus. *Syst. nat.* xii. 3. p. 72. n. 4.

Zeolites facie vitrea. *Wall. syst. min.* 1 p. 271.

Tourmaline. *Kirawan mineral.* 1. p. 271.

Turmalin from Zeylon. *Schmeisser mineral.* 1. p. 78.

Electric Shorl. *Thomson chem.* 3. p. 546.

Found in the rivers of Ceylon, in Brazil, Castilia, the islands on the coast of France, Greenland, Norway, Sweden, Switzerland, and Germany, and near Freyburg in Saxony, in Granite, Gneiss, and other similar rocks, sometimes in amorphous pieces, but more frequently crystallized in 3 or 9 sided prisms, with 4-sided summits, sometimes in grains: colour generally green, sometimes brown, red, or blue: crystals 3. 6 or 9-sided prisms, variously truncated, with the faces usually longitudinally striated: is laterally transparent, but not longitudinally: fracture conchoidal, with often a tendency to the foliated: is not readily acted upon by acids: reddens when heated, and melts with difficulty into a white or grey enamel: when heated to 200° of Fahrenheit, is electric, attracting light bodies by one end, and repelling them by the other; but if one end be heated and the other be cold, attracting them at both ends: specific gravity from 3,05. to 3,155. contains silica 40. alumina 39. oxyde of iron 12. lime 4. oxyde of manganese 2,5. *Vauquelin.*

## ORDER V. SILICEOUS.

*Consisting principally of Silica: hard.*

42. GEMMA. Consisting of silica and a larger proportion of alumina, with sometimes a little carbonate of lime, and oxyde of iron: meagre to the touch, of a high internal lustre, very rarely opaque or subopaque, never hardish or soft, breaking into indeterminate fragments, parasitical, shining in the dark, attracting light bodies when heated by friction: not melting with alcalies.

*Rubinus.* Very hard, ponderous, red, of a foliated texture, which in a contrary direction is conchoidal, not melting or losing its colour in the fire.

Alumen Gemma Rubinus. *Syst. nat.* xii. 3. p. 102. n. 6.

Gemma pellucidissima. *Wall. syst.* 1. p. 235. n. 2.

Oriental Ruby. *Kirwan miner.* 1. p. 250.

True Ruby. *Schmeisser miner.* 1. p. 60.

Perfect Corundum. *Thomson chem.* 3. p. 505.

Found in *Brazil* and the *East Indies*, principally in the kingdoms of *Peru* and *Ceylon*, and is, except the Diamond, the most precious of all the gems: colour carmine red, sometimes verging to violet, or between carmine and hyacinth red, sometimes red and white or red and blue, or orange-red: is found in angular pieces, in small pebbles, or in regular 6-sided pyramids joined to and opposed base to base: seldom exceeding an inch in size: when finely powdered, melting with borax, though with difficulty into a greenish glass: specific gravity from 3,76. to 4,283. contains alumina 40. silica 39. carbonate of lime 9. oxyde of iron 10. *Bergman.*

*Sapphirus.* Very hard, somewhat ponderous, blue, making a white streak, of a slightly incurved lamellar texture, not fusible but losing its colour in a strong heat.

Alum. lapid. pellucid. *Syst. nat.* xii. 3. p. 103. n. 6. c.

Gemma pellucidissima. *Wall. syst. min.* 1. p. 237. n. 3.

Oriental Sapphire. *Kirwan miner.* 1. p. 252.

Perfect Corundum. *Thomson chem.* 3. p. 505.

Sapphire. *Schmeisser min.* 1. p. 58.



Found in *Brasil*, the *Indies*, *Persia*, *Bohemia*, and near *Pays* in *Velay*, sometimes crystallized, sometimes in rounded masses, the angles being worn off by friction, and is next in value to the Ruby: colour sky-blue, or the shades of Prussian and indigo-blue, with sometimes white specks: the crystals are strong, shining, and exhibit a foliated texture transversely striate; they become colourless when heated with microcosmic salt, and emit a great light while burning: specific gravity from 3,780. to 4,000. contains alumina 58. silica 35. carbonate of lime 0,5. iron 0,2. *Bergman*.

*Topazius*. Nearly very hard, ponderous, yellow, of a foliated texture which is conchoidal when broken transversely, not fusible per se, but losing all its colour in a strong heat.

Borax Topazius. *Syst. nat.* xii. 3. p. 94 n. 2. a.

Gemma pellucidissima. *Wall. syst.* 1. p. 239. n. 4.

Oriental Topaz. *Kirwan mineral.* 1. p. 251.

Topaz. *Schmeisser mineral.* 1. p. 62.

Imperfect Corundum. *Thomson chem.* 3. p. 505.

Found in *India*, *Brasil*, *Russia*, *Saxony*, *Bohemia*, &c. generally adhering to other substances, though sometimes detached with the angles worn off: colour a lighter or deeper yellow, most commonly honey-colour, sometimes verging to white or greenish: its fragments are sometimes irregular, sometimes granular or prismatic: the prisms longitudinally striate, solitary, in pairs, or in threes disposed in a cruciate manner, often clustered, rarely 4-sided, rectangular or obliquangular, more frequently unequally 8-sided terminated by an irregular 4 or 8-sided pyramid, or ending in a point: is infusible per se, and loses its colour only in a very high degree of heat: melts with borax and microcosmic salt into a clear glass: specific gravity from 3,531. to 3,564. contains silica 52. alumina 44. carbonate of lime 2. oxyde of iron 0,31. *Bergman*.

*Hyacinthus*. Hard, lamellar, of a peculiar yellowish-red, in 4-sided prisms terminated both sides by a 4-sided pyramid, not fusible per se, but losing its colour in a strong heat.

Nitrum lapidosum. *Syst. nat.* xii. 3. p. 85. n. 3. a.

Topazius flave-rubens. *Wall. syst.* 1. p. 240. n. 4. 1.

Hyacinth. *Kirwan mine-al.* 1. p. 257.

Zircon, Jargon, Hyacinth. *Thomson chem.* 3. p. 521.

Hyacinth. *Schmeisser mineral.* 1. p. 64.

Found in the *East* and *Bohemia*, in the form of pebbles, in obtuse angular pieces: colour yellowish-red with a mixture of brown: the crystals are small, have a smooth surface and

foliated texture: they are imitated by heating rock crystals and putting them into a solution of dragon's-blood: contains alumina 40. carbonate of lime 20. oxyde of iron 13. *Bergman.*

*alabandica.* Hard, pellucid, of a red colour, not fusible but losing its colour in a strong heat.

*Ferber n. Beytr. mineral.* 1. p. 585.

Found in the river *Goetch* near *Lengefeld*, in the form of rounded granulations, from the size of a pea to that of a bean: when exposed in a strong heat surrounded with wood-ashes, loses all its colour, and is often sold for the Diamond.

*Rubicellus.* Hard, of a reddish colour verging to pale yellow, not fusible but losing its colour in a strong heat.

Rubinus col. rubeo subflavo. *Wall. syst.* 1. p. 236. n. 2. d.

Occidental or Brazilian Ruby. *Kirwan min.* 1. p. 254.

Found in the *East Indies*: is softer than the 'Topaz, and of a much inferior colour: fracture foliated.

*Spinellus.* Hard, of a pale red colour inclining to orange, not fusible but losing its colour in a strong heat.

Rubin. col. rubeo subalbo. *Wall. syst.* 1. p. 236. n. 2. c.

Spinell and Balass Ruby. *Kirwan miner.* 1. p. 253.

Spinell. *Schmeisser miner.* 1. p. 61.

Spinell. *Thomson chem.* 3. p. 514.

Found in *Ceylon*, in 8-sided crystals, consisting of 2 pyramids, each of 4 planes, and joined base to base; or triangular, or trapezoidal plates bevelled on the edges: texture foliated: fracture conchoidal: specific gravity from 3,570. to 3,625. contains alumina 76. silica 16. magnesia 8. oxyde of iron 1,5. *Klaproth.*

*Aqua marina.* Hard, pellucid, lamellar, pale sea-green, not fusible per se, breaking into trapezoidal fragments.

Borax lapidosus. *Syst. nat.* xii. 3. p. 95. n. 2. c.

Smaragdus. *Wall. syst. min.* 1. p. 242. n. 5. c.

Beryll. *Kirwan miner.* 1. p. 248.

Aquamarine, Beryl. *Schmeisser miner.* 1. p. 66.

Beryl, or Aqua Marina. *Thomson chem.* 3. p. 557.

Found in *Brazil*, *India*, *Siberia*, *Saxony*, and *Bohemia*, sometimes amorphous, sometimes crystallized in equiangular 6-sided prisms longitudinally striated: its longitudinal fracture rather conchoidal, its transverse fracture foliated: colour rarely a bluish-green: it decrepitates when heated, and is generally a little discoloured, but does not melt: becomes electric by friction, when one of its ends is attractive, the other repulsive: specific gravity from 3,521. to 3,548. contains silica 69. alumina 13. glucina 16. oxyde of iron 1. lime 0,5. *Vauquelin.*

*Euclasius.* Hard, pellucid, lamellar; green, in 4-sided oblique prisms whose edges are variously truncate and whose faces are oblique.

*Euclasius.* *La Metherie Journ. Phys.* 1792. Aug. p. 155.

*Euclase.* *Thomson chem.* 3. p. 558.

Found in *Peru*: is very brittle and sufficiently hard to scratch quartz: texture foliated: fracture conchoidal: causes double refraction: is fusible by the blowpipe into a white enamel: specific gravity 3,0625. contains silica 36. alumina 23. glucina 15. oxyde of iron 5. *Vauquelin.*

*Scorlites.* Hardish, somewhat ponderous, diaphanous, of a greenish or yellowish-white colour which is not altered by the fire, not fusible per se.

*Schoerlit.* *Klaproth chem. annal.* 1784. 2. p. 391.

*Shorlite.* *Kirwan miner.* 1. p. 286.

*Shorlite.* *Thomson chem:* 3. p. 528.

Found in *Brasil* and *Saxony*, with mica or quartz, generally in oblong masses, which when regular are 6-sided prisms: fracture uneven, and seemingly somewhat foliated: specific gravity 3,530. contains alumina 50. silica 50. *Klaproth.*

*Beryllus.* Hard, of a blue-green colour, not altering its colour or fusible by heat, of a conchaceous texture which is foliated when broken transversely, in 6-sided prisms which are usually longitudinally striate:

*Beryllus.* *Cronst. min.* 42. 2.

*Beryll.* *Kirwan miner.* 1. p. 248.

*Beryll.* *Schmeisser* 1. p. 66. *Thomson chem.* 3. p. 557.

Found in the mountains of *Saxony*, *Siberia*, &c. in Quartz, Granite, Wolfram, and other matrices: its crystals are of various magnitude, sometimes diaphanous sometimes pellucid, rarely solitary or in pairs, generally aggregate or fascicled: colour approaching to green or blue, rarely to yellow: specific gravity from 2,250. to 2,782. contains a very small proportion of alumina, lime, and iron.

*Chrysoberyl-lus.* Hard, pellucid, green, highly shining internally, of a conchaceous texture.

*Chrysolithus.* *Wall. syst. min.* 1. p. 244. n. 6. c.

*Chrysoberyll.* *Kirwan mineral.* 1. p. 261.

*Chrysoberyl.* *Thomson chem.* 3. p. 510.

Found in *Brasil* and *Ceylon*, in round masses about the size of a pea, or crystallized; the form of its crystals being a 4-sided rectangular prism, the most common variety of which is an 8-sided prism terminated by 6-sided summits: colour yellowish-green, with a sparkling surface: texture foliated, with the foliations parallel to the faces of the prism: causes

double refraction: is infusible by the blowpipe: specific gravity from 3,698. to 3,761. contains alumina 71,5. silica 18,0. lime 6,0. oxyde of iron 1,5. *Klaproth*.

*Chrysolithus* Hardish, pellucid, lightish, of a green colour which vanishes in a strong heat, fusible by the blowpipe and sparkling when melted, of a conchoidal texture.

Borax lapidosus. *Syst. nat.* xii. 3. p. 94. n. 2. b.

Gemina pellucidissima. *Wall. syst.* 1. p. 243. n. 6.

Chrysolithus. *Baum. miner.* 1. p. 234.

Chrysolite. *Kirwan.* 1. p. 262. *Thomson chem.* 3. p. 591.

Chrysolith. *Schmeisser miner.* 1. p. 72.

Found in *Brazil*, *Ceylon*, *Siberia*, *Transylvania*, and *Bohemia*, in angular fragments, grains, and crystallized: colour yellowish-green mixed with brown, or verging to olive-green: surface of a fine splintery or scaly appearance, but such of the crystals as have not been injured by friction have their broadest sides longitudinally striate; but where the surface has not suffered by attrition, it has a considerable lustre: the regular shape of its crystals is a 6-sided flattened prism, terminated in 6-sided pyramids, and differs from rock crystal in having the pyramids more obtuse: specific gravity from 3,265. to 3,450. contains magnesia 41,5. silica 38,5. oxyde of iron 19,0. *Klaproth*.

*Smaragdus*. Hard, pellucid, lightish, grass-green, when heated to 120 of Wedgewood becomes blue, but recovers its green colour when cold, melting before the blowpipe, of a conchoidal texture.

Borax lapidosus. *Syst. nat.* xii. 3. p. 95. n. 2. d.

Gemma pellucidissima. *Wall. syst.* 1. p. 241. n. 5.

Emerald. *Kirwan* 1. p. 247. *Thomson chem.* 3. p. 556.

Emerald. *Schmeisser mineral.* 1. p. 67.

Found in the mountains of *Egypt* and *Ethiopia*, in *Peru*, *Russia*, and the confines of *Persia*: colour from the perfect to the pale grass green: crystals hexagonal prisms, either perfect or truncate on the angles and edges, terminating in truncated pyramids: texture foliated: fracture conchoidal: becomes electric by friction but not by heat: causes a double refraction: melts into an opaque coloured mass at 150° of Wedgewood: specific gravity from 2,650. to 2,775. contains silica 64,60. alumina 14,00. glucina 13,00. oxyde of chromium 3,50. lime 2,56. moisture or other volatile ingredient 2,00. *Vauquelin*.

*Soranus*. Hard, pellucid, somewhat ponderous, foliated, of an hyacinth colour which is permanent in a moderate heat, easily melting in a strong heat into an opaque spumid mass.

Hyacinthus Gemma. *Cronst. miner.* 69. A. 2 o.

Gemma Granites. *Wall. syst. min.* 1. p. 253. n. 4. a. b.

Found in Switzerland, Norway, Greenland, and the mountains of Siberia, in Brazil and Ceylon, sometimes in the form of rounded grains mixed with sand or earth, sometimes imbedded in other stones, in 6-sided crystals terminated each side by a 3-sided pyramid: is twice as hard as spar, and loses its colour when sprinkled with the stronger mineral acids.

**Granatus.** Hard, ponderous, red, of unequal texture, preserving its colour in a low heat, melting in a stronger heat into a brown opaque spumid mass.

Borax tessellatus. *Syst. nat.* xii. 3. p. 72. n. 5.

Gemina plus minus pellucida. *Wall. min.* 117.

Garnet. Carbuncle. *Kirwan mineral.* 1. p. 258.

Garnit. *Schmeissner mineral.* 1. p. 69.

Garnet. *Thomson chem.* 3. p. 572.

Silex Granatus. *Sorverby Brit. min.* t. 43, 44.

1. Pellucid.

Granat. crystal. pellucid. *Wall. syst.* 1. p. 253. n. 4.

2. Opaque.

Granat. crystal. opac. *Wall. syst.* 1. p. 253. n. 3.

Borax margodes. *Syst. nat.* xii. 3. p. 73. n. 6.

3. Breaking into granular fragments.

Granat. fig. indeterminat. *Wall. syst.* 1. p. 250. n. 1.

Granat. partic. granulat. *Cronst. miner.* 69. A. 1.

4. Breaking into crustose fragments.

Granat. fig. indeterminat. *Wall. syst.* 1. p. 251. n. 2.

5. Of a common form.

6. In the form of loose rounded grains with the angles worn off, and found in rivers, the common soil, and among sand.

7. In the form of crystals, and generally imbedded in a matrix, light.

a. In double 4-sided pyramids,

With the tips truncate.

*Gmel. syst. nat.* 3. p. 447. t. 1. f. 36.

b. In double 8-sided pyramids.

Each side augmented by another 4-sided depressed pyramid.

*Amœn acad.* 1. p. 482.

c. In 3-sided pyramids, with the margins of the sides and base truncate.

*Gmel. syst. nat.* 3. p. 447. t. 1. f. 37.

d. In 6-sided pyramids, with the margins of the base truncate.

*Gmel. syst. nat.* 3. p. 445. t. 1. f. 2.

## 8. In 6-sided prisms.

a. The prisms perfect.

b. The prisms terminated each side by a 3-sided pyramid.

*Gmel. syst. nat.* 3. p. 446. t. 1. f. 26.

The faces smooth.

The faces diagonally striate.

The margins of the prisms truncate.

*Gmel. syst. nat.* 3. p. 447. t. 1. f. 32.

All the margins truncate.

*Gmel. syst. nat.* 3. p. 447. t. 1. f. 28.*Sowerby Brit. miner. tab.* 43.

## 9. In 12-sided prisms.

*Gmel. syst. nat.* 3. p. 445. t. 1. f. 25.*Amæn. acad.* 1. p. 482. t. 16. f. 25.

Found in *Britain* and various parts of *Europe*, *Madagascar*, *Ethiopia*, *India*, *Syria*, &c. sometimes in mass, sometimes crystallized, in innumerable varieties of black, brown, purple, red, green, and yellow: texture foliated: fracture commonly conchoidal: lustre glassy and waxy: colour most commonly red: is brittle and easily broken, and often attracted by the magnet: specific gravity from 3,750. to 4,188. contains silica 52,0. alumina 20,0. oxyde of iron 17,0. lime 7,7. *Vauquelin*.

Granadil-  
lus.

Hard, rather ponderous, red, of a parallelly fibrous texture, melting with difficulty, in acicular prismatic crystals.

*Rother Schoerl. Bindheim. chem. annal.* 1792. 2. p. 317.*Red Shorl. Schmeisser mineral.* 1. p. 81.

Found in *Savitzerland*, the *Pyrenees*, *Castile*, *Hungary*, and *Siberia*, generally in Quartz or Granite: colour from that of a peach-blossom to a blood-red: diaphanous, shining outwardly, breaking into acute fragments, exhibiting convex faces when broken transversely, acquiring a high glossy polish: the acicular crystals sometimes scattered, sometimes clavate, sometimes disposed in a reticular manner: specific gravity 3,100. contains in 200 parts, silica 114. alumina 70. magnesia 1. oxydes of iron and manganese 10.

43. OLIVINUS. Consisting of the greater part silica, and a smaller proportion of alurina and oxyde of iron: found in basalt, shining internally, generally of a common form; hard, mouldering in the air: melting with difficulty.

*Werneri.* Tinged, diaphanous, of a conchaceous texture, breaking into indeterminate fragments.

Olivin. *Werner Bergm. Journ.* 1790. 7. p. 55.

Olivin. *Kirwan min.* 1. p. 263. *Schneisser* 1. p. 73.

Olive Chrysolite, Olivine. *Thomson chem.* 3. p. 592.

Found in Arthur's seat near *Edinburg*, in *France*, *Germany*, and most parts of *Europe*, imbedded in Basalt, sometimes in the form of grains, sometimes in large pieces: colour olive or yellowish-green, and when withered brownish or ochre-yellow: is attacked by digestion in nitric acid, and its ferruginous parts taken up: specific gravity from 2,960. to 3,225.

*Vitreus.* Pellucid, pure white, of a glassy texture: breaking into indeterminate fragments, with the surfaces spherically convex.

Hyalite, Mullers glass. *Kirwan mineral.* 1. p. 296.

Hyalite. *Thomson chem.* 3. p. 563.

Found in *Germany*, *Hannover*. and *Frankfort*, in rocks of trap or serpentine, and occurs in the form of grains, filaments or rhomboidal masses: texture foliated: fracture inclining to rhomboidal: is generally transparent, sometimes, though seldom, opaque: is infusible at 150° of Wedgewood, but yields to Soda: specific gravity 2,110. contains silica 57. alumina 18: lime 15: and a very little iron. *Link.*

*spatosus.* Diaphanous, white, of a foliated texture, breaking into rhomboidal fragments.

Feldspat. *Nose Orog. Brief.* 1. p. 224.

Found in *Goettingen* in Basalt, and on mount *Mendenburg* on the *Rhine*; resembles Feldspar, but is harder, and much more difficult of fusion.

*fibrosus.* Diaphanous, white, fibrous, hard, shining.

*V. H. Miner. Beob. Basalt. a. Rhein.* p. 111.

Found on the banks of the *Rhine*, near *Unkel*, imbedded in basalt, and is very brittle.

44. **FELDSPATUM.** Consisting of the greater part silica, some alumina and potash, and a very small quantity of lime and oxyde of iron: hard, lightish, shining, lamellar, breaking into fragments which present 4 faces, mouldering into argil, parasitical: not effervescing with nitric acid, easily melting without ebullition into a pellucid glass.

*cubicum.* Reddish-brown, of a glassy lustre, and somewhat splintery fracture, breaking into cubic fragments which are not specular, falling spontaneously into crustose fragments.

Petrolite, Cubic felspar. *Kirawan miner.* 1. p. 325.

Found, though rarely, in *Saxony*, of a common form, diaphanous or somewhat opaque: fragments cubic or inclining to that form, the faces of which are not polished: is very brittle, and at 160° of heat whitens and concretes without any farther sign of fusion: specific gravity 3,081.

*vulgare.* Of a glassy lustre and foliated texture, breaking into rhomboidal fragments with 4 specular faces.

Spatum fixum scintillans. *Syst. nat.* xii. 3. p. 153. n. 6.

Spatum scintillans. *Cronst. miner.* 66. H.

Spatum durum. *Wall. min.* 61.

Common Felspar. *Kirawan mineral.* 1. p. 317.

Common Felspar. *Schmeisser mineral.* 1. p. 132.

Common Felspar. *Thomson chem.* 3. p. 554.

1. Opaque.

Spatum campestre. *Syst. nat.* xii. 3. p. 50. n. 12.

Spatum scintillans. *Wall. syst. miner.* 1. p. 205. n. 1.

2. Transparent.

Spatum silicum. *Syst. nat.* xii. 3. p. 50. n. 13.

Spatum scintillans. *Wall. syst. min.* 1. p. 206. n. 2.

3. Of a common form.

4. In the form of crystals,

Spat. scintill. crystallis. *Wall. syst.* 1. p. 207. n. 3.

Spat. scintill. drusicum. *Cronst. mineral.* 66. 2.

a. The crystals prismatic,

The prisms acicular.

b. The crystals parallelepiped.

c. The crystals thicker, with the sides more equal.

In 4-sided right angles.

In 6-sided right angles.



In 8-sided right angles.  
 In 4-sided oblique angles.  
 In 6-sided oblique angles.

Found every where in primitive mountains, forming a part of Granite, Porphyry and Gneiss rocks, compact, solid, and incorporated with other substances; and generally moulders into a kind of porcelain clay: colour generally flesh-colour, blueish-grey, yellowish-white, milk-white or brownish-yellow, rarely blue or olive green, very rarely black: texture in straight shining foliations, cross fracture uneven: when heated, the crystallized kind often decrepitates: it is less hard than Quartz, but strikes fire with steel: specific gravity from 2,272. to 2,594. contains silica 62,83. alumina 17,02. potash 16,00. lime 3,00. oxyde of iron 1,00. *Vauquelin*.

*variable.* Of a vivacious lustre, reflecting various colours in certain positions of light, of a foliated texture, breaking into rhomboidal fragments with 4 specular faces.

Labradorstein. *Lefk. Naturf.* 12. p. 145.

Labradore stone. *Kirwan mineral.* 1. p. 324.

Labradore Feldspar. *Thomson chem.* 3. p. 555.

Labrador stone. *Schmeisser mineral.* 1. p. 134.

Found on the *Labradore coast*, the island *St. Paul's*, in various parts of *America* and *Europe*, in round masses and detached, and often containing *Scorl*, *Mica*, and *Pyrites*: colour dark or light grey, diaphanous or semipellucid, receiving a high polish, and reflecting various colours of blue, purple, red, green, &c. in certain positions, in spots or stripes: specific gravity from 2,6700. to 2,6925.

*lunare.* Pellucid, white, of a high lustre, and straight lamellar texture, breaking into rhomboidal fragments.

Moon-stone. *Kirwan. mineral.* 1. p. 322.

Moonstone. *Schmeisser min.* 1. p. 136.

Pure Feldspar. *Thomson chem.* 3. p. 555.

Found in *Ceylon* and *Switzerland*, *Bohemia* and *Saxony*, in solid masses and also crystallized: the crystals rhomboidal, of irregular angular broad 6-sided columns terminating in pyramids and in rectangular 4-sided plates: colour white, with sometimes a shade of yellow, green or red, the surface often reflecting iridescent colours: the fragments often appear striated: specific gravity 2,559. contains silica 64. alumina 20. potash 14: lime 2. *Vauquelin*.

*fibrosum.* Fibrous, with the fibres parallel and in distinct layers.

*Lindacker ap. J. Mayer Samml. Phys. Auff* 2 p. 278.

Found scatteredly in *Bohemia*, with frequently the vestiges of quartz or mica: colour usually brown: shining internally like mother of pearl, breaking into indeterminate fragments, and is harder than rock-crystal.

*Oculus Catii.* Diaphanous, of an imperfectly foliated texture, exhibiting parallel fibres internally, breaking into somewhat irregular fragments.

*Silex Oculus Catii.* *Syst. nat.* xii. 3. p. 69. n. 6. c.

*Achates plus minus opaca.* *Wall. syst.* 1. p. 282. n. 26.

*Cat's eye.* *Kirwan miner.* 1. p. 301. *Schmeisser.* 1. p. 137.

*Cat's eye.* *Thomson chem.* 3. p. 524.

Found in *Ceylon* and *Siberia*, of a near'y square figure, with sharp edges and a good deal of brilliancy: colour grey, with a tinge of green, yellow or white, in certain positions reflecting a splendid white like the eye of a Cat, sometimes brown with a yellow or red tinge: its texture is so compact, that the foliations are hardly discernible, and is so hard as to strike fire with steel: specific gravity from 2,625. to 2,660. contains silica 94,50. alumina 2,00. lime 1,50. oxyde of iron 0,25. *Klaproth.*

45. PYROMACHUS. Consisting principally of silica, with a small portion of alumina and oxyde of iron, and frequently a little carbonate of lime: hard, semitransparent, lightish, of a conchoidal texture, breaking into indeterminate very acut-angled fragments, rarely separating into concentrically crustose fragments, with hardly any lustre, found chiefly in stratarial mountains, and rarely forming strata itself: not fusible per se before the blowpipe.

*cinereus.* Greyish, approaching to subopaque, and of a somewhat splintery texture.

*Silex marmoreus vagus.* *Syst. nat.* xii. 3. p. 68. n. 3.

*Silex cinereus.* *It. Wgoth.* 73.

Found detached in *Lusatia*, and on mount *Mosseburg* in *Westrogoth*, covered with a hard white marmoreous crust: it approaches to a petrosilex.

*striatus.* White, of a texture approaching to fibrous.

*Wall. syst. min.* 1. p. 266. n. 7.

Found on the cretaceous hills of *England*.

*cretaceus.* Tinged, semitransparent, of a perfectly conchoidal texture.

*Silex vagus.* *Syst. nat.* xii. 3. p. 67. n. 1.

*Silex opacus.* *Wall. syst. min.* 1. p. 262. n. 4.

*Silex communis.* *Cronst. miner.* 61.

Flint. *Kirwan* 1. p. 301. *Schmeißer* 1. p. 98.

Flint. *Thomson* 3. p. 519. *Sowerby Brit. min.* t. 88.

Found in *Britain, France, Denmark*, and other *European* countries, in detached pieces of various shapes and sizes, and generally covered with a white calcareous coat: it is most common among chalk, and often arranged in some kind of stratified order: colour varying from honey-yellow to brownish-black, with variations often in the same specimen in the form of veins, stripes, clouds or dots: it frequently contains petrifications, particularly of the crustaceous and small coralline kind, and sometimes bears the impression of *Echinites* and *Belemnites*: when two pieces are rubbed smartly together, they phosphoresce and emit a peculiar odour: when heated it decrepitates, and becomes white and opaque: specific gravity from 2,580. to 2,630. contains silica 98,00, lime 0,50. alumina 0,25. oxyde of iron 0,25. water 1,00. *Klaproth*.

*semipellucidus*. Light, nearly semitransparent.

*Silex Pyromachus*. *Syst. nat.* xii. 3. p. 67. n. 2.

*Silex semipellucidus*. *Wall. syst.* 1. p. 265. n. 6.

Found in *France, Wirtemberg, Franconia*, and *Iceland*, generally mixed with the last, but more rare: colour white, honey-colour, reddish, blueish, or variegated.

*crystallinus* Crystallized in a 3-sided depressed pyramid.

1. The pyramid simple.

*Werner Cronst. mineral.* p. 137.

*Hoffmann Bergm. Journ.* 1778. 1. p. 282.

Found in *Saxony*, near *Schneeberg*.

2. The pyramid double.

*Karsten Leske mineral.* 1. p. 113.

Found in *Saxony*, near *Johanngeorgenstadt*.

46. PETROSILEX. Consisting of the greater part silica, about 22 per cent. of alumina, and 6 per cent. of carbonate of lime: hardish, lightish, found in primeval and stratified mountains, without lustre, breaking into indeterminate fragments, of a splintery texture: melting before the blow-pipe.

*opacus*. Nearly opaque, of a common form.

Petrosilex, Lapis corneus. *Cronst. miner.* 92.

Hornstone, Chert. *Kirwan mineral.* 1. p. 303.

Chert. *Schmeisser miner.* 1. p. 101.

Hornstone, Chert. *Thomson chem.* 3. p. 528.

1. In texture resembling lesser splinters.  
Petrofalex opacus. *Wall. syst. min.* 1. p. 268. n. 9.  
a. With the colours alternating in strata.  
Silex polyzonias. *Syst. nat.* xii. 3. p. 71. n. 16.
2. In texture resembling larger splinters.  
Petrofalex opacus. *Wall. syst. min.* 1. p. 267. n. 8.  
a. Of a greenish colour.  
Silex virescens. *Syst. nat.* xii. 3. p. 70. n. 12.

Found in *Sweden* and *Germany*, forming veins and beds of mountains, and frequently in nodules like kernels in rocks: colour usually blue-grey, sometimes grey, blue, and green of various shades: by breathing on it it discovers an earthy smell, and is sometimes so hard as to strike fire with steel: it decomposes sooner than flint, and does not take so high a polish: in the fire it decrepitates and whitens: specific gravity from 2,699. to 2,708. contains silica 72. alumina 22. carbonate of lime 6. *Kirwan.*

*diaphanus.* Semitransparent, of a common form.

Silex Petrofalex. *Syst. nat.* xii. 3. p. 70. n. 11.

Petrofalex semipellucidus. *Wall. syst.* 1. p. 271. n. 12.

Found with the last species: colour grey, white, ochraceous, rosy, flesh-colour, brownish-red, yellowish or reddish-brown, green, or variegated: it often receives a fine polish.

*crystallinus.* In rough crystals which are frequently hollow within.

*Beyer chem. annal.* 1786. 1. p. 63. 2. p. 190.

1. In 6-sided perfect prisms.
2. In 6-sided prisms, terminated each side by convex surfaces.
3. In 6-sided prisms, terminated each side by a 3-sided pyramid.
4. In cubes.
5. In 6-sided tables.
6. In double 4-sided pyramids.
7. In double 3-sided pyramids.
8. In double 3-sided depressed pyramids.
9. In single 3-sided minute pointed pyramids.

Found in *Saxony*, near *Schneeberg*, sometimes covered with a thin earthy coating.

47. JASPIS. Consisting of silica, a smaller proportion of alumina, and a small quantity of oxyde of iron, with generally a little magnesia and potash: hardish, opake, breaking into indeterminate fragments, of a conchoidal texture, lightish, sometimes detached, sometimes a principal ingredient of ancient mountains, of a common form: losing its colour in the fire.

*ægyptia.* Of a dull colour, varied with differently coloured concentric stripes or layers, and black dendritical figures.

Silex Hæmachates. *Syst. nat.* xii. 3. p. 68. n. 4.

Caillon d' Egypte. *Cronst. min. syst.* 60. 6. a.

Ægyptian pebble. *Kirwan mineral.* 1. p. 312.

Egyptian Pebble. *Schmeisser mineral.* 1. p. 124.

Egyptian Pebble. *Thomson chem.* 3. p. 532.

Found near Suez in Egypt, and sometimes in Hungary, generally in longish oval flattish pebbles, and enveloped in a coarse rough crust: colour a liver-brown, glittering when broken, the fragments irregularly angular and opake, and taking a fine polish: the concentric stripes or layers are various shades of yellow, reddish, green, or white, but the dots and dendritical figures are always black: fracture conchoidal: when heated it does not decrepitate: specific gravity from 2,564. to 2,600. It is made into vases, snuff-boxes, and other ornaments.

*fasciata.* In differently coloured alternate parallel layers, without lustre internally, of an imperfectly conchoidal texture.

Jaspis variegata. *Wall. syst. min.* 1. p. 301. n. 2. 1.

Ribband Jasper. *Schmeisser miner.* 1. p. 125.

Striped Jasper. *Kirwan.* 1. p. 312. *Thomson Chem.* 3. p. 532.

Found in Siberia, in Saxony near Gnantstein and Wolfstutz, and particularly fine at Ural, in large amorphous masses forming long layers: colours yellowish, greenish-grey, ochraceous, isabella yellow, brownish-red, pale or dark flesh-red, mountain or dark green, generally disposed in parallel layers which are commonly straight, rarely curved, seldomer in oblong spots: when broken it exhibits a dull imperfectly conchoidal surface, and is sometimes semitransparent on the edges: it takes a high polish: specific gravity from 2,500. to 2,820.

*porcellana.* Hard, rifted internally, of an imperfectly conchoidal fracture inclining to the even.

Porcellanite. *Kirwan mineral.* 1. p. 313.

Porcelane Jasper. *Schmeisser mineral.* 1. p. 125.

Porcelane Jasper. *Thomson chem.* 3. p. 533.

Found in large compact layers, and frequently between the fissures of Basaltes, in *Bohemia* and *Saxony*: has an arid appearance when broken, like dried clay, and is full of cracks or flits; and is supposed to have been altered by the action of fire: specific gravity 2,330. contains silica 60,75. alumina 27,25. magnesia 3,00. oxyde of iron 2,50. potash 3,60. *Rose.*

*vulgaris.* Hardish, shining or polished internally, of one uniform colour or veined or spotted.

Jaspis. *Cronst. mineral. sect.* 63. 65.

Common Jasper. *Kirwan mineral.* 1. p. 310.

Common Jasper. *Schmeisser miner.* 1. p. 126.

Common Jasper. *Thomson chem.* 3. p. 533.

1. Of one uniform colour.

Silex Jaspis. *Syst. nat.* xii. 3. p. 71. n. 13, 14.

Jaspis partic. subtiliss. *Wall. syst.* 1. p. 297. n. 1.

2. Variegated.

Jaspis partic. subtiliss. *Wall. syst.* 1. p. 299. n. 2.

Found in *Germany*, *Saxony*, *Silesia*, *Hungary*, &c. in large compact masses, sometimes coarsely interspersed in alternate layers with other stones, and often in obtuse angular pieces: colours different shades of black, white, yellow, red, brown, and green, often variegated, spotted or veined with several colours: is frequently enriched with iron and gold ores, and admits a fine polish: fracture conchoidal, or sometimes imperfectly foliated: specific gravity from 2,530. to 2,700.

48. LAZULUS. Consisting of silica, with a lesser proportion of alumina and carbonate of lime, and a small quantity of sulphate of lime and oxyde of iron: opaque, hardish, blue, dense, without internal lustre, breaking into indeterminate fragments, producing a white powder when pounded: neither losing its colour nor effervescing from acids sprinkled on it, melting easily in the fire into a frothy slag.

*orientalis.* LAZULUS.

Cuprum Lazuli. *Syst. nat.* xii. 3. p. 145. n. 12.

Zeolites partic. subtiliss. *Wall. syst.* 1. p. 312. n. 3.

Lapis Lazuli. *Kirwan miner.* 1. p. 283.

Lapis Lazuli. *Schmeisser mineral.* 1. p. 150.

Lazulite, *Thomson chem.* 3. p. 561.

Found in the confines of *Siberia, Tartary, and China*, in *America*, and various parts of *Europe*, generally in solid masses, and usually full of veins of quartz, limestone and pyrites: colour sky-blue, often with white or yellow spots or veins: if calcined it effervesces a little with acids, and forms with them a gelatinous mass: it retains its colour a long time in the fire, but at last becomes brown: when boiled in concentrated vitriolic acid, it dissolves slowly, and loses its colour. It is used for extracting that fine colour, called ultramarine, and is manufactured into various vessels, and used in Mosaic work. Specific gravity from 2,760. to 2,945. contains silica 46,0. alumina 14,5. carbonate of lime 28,0. sulphate of lime 6,5. oxyde of iron 3,0. water 2,0. *Margraff*.

49. SMIRIS. Consisting of alumina, silica, and a large quantity of iron: very hard, of a common form, opaque, attracted by the magnet, red when powdered: not fusible per se.

*poliens.*

#### SMIRIS.

Ferrum retract. rubricos. *Syst. nat.* xii. 3. p. 139. n. 17.

Ferr. mineralis. *Wall. syst. min.* 2. p. 343. n. 9.

Emery. *Kirwan miner. Schmeisser mineral.* 2. p. 85.

Emery. *Thomson chem.* 3. p. 509.

Found at *Guernsey*, in *Germany, Italy, and Spain*, in the islands of the *Archipelago*, but is usually imported from the isle of *Naxos*, always in shapeless masses, and mixed with other minerals: colour greyish-black, when reduced to powder reddish-grey: has a granular texture, and is so hard as to cut all stones except the diamond, upon which account it is principally used in the form of powder for polishing metals: specific gravity about 400.

50. CIRCONIUS. Consisting of filica, a more than double proportion of circonia, and a very small quantity of metallic oxyde, partly of iron partly of nickel: very hard, ponderous, imitating the diamond in its lustre, parasitical, foliated with the foliations incurved, crystallized: not fusible per se.

zeylanicus. CIRCONIUS.

Jargon. *Kirwan mineral*. 1. p. 333.

Zircon, Jargon. *Schmeisser miner*. 1. p. 56.

Zircon, Jargon. *Thomson chem*. 3. p. 525.

Found in *Ceylon*, in small irregular grains, or crystallized in 4-sided rectangular prisms terminated each side by a 4-sided pyramid, or in double 4-sided pyramids: colour grey, greenish, yellowish-brown, reddish-brown or violet: is strongly semitransparent, sometimes opaque: it scratches glass, and is not altered by the heat in which the diamond is consumed: specific gravity 4,416. contains zirconia 68,0. filica 31,5. nickel and iron 0,5. *Klaproth*.

51. AMARUS. Consisting of filica, a smaller proportion of magnesia, a very small quantity of alumina and carbonate of lime, and 10 per cent. of oxyde of iron: hard, tenacious, subopaque, a little greasy, green, of a splintery texture, breaking into indeterminate fragments, of a common form: not fusible per se.

amazonicus. AMARUS.

*Hoepfner magaz. Natur. Helvet*. 1. p. 257.

Jaspis unicolor. *Wall. syst. min*. 1. p. 302. n. 4.

Found in the *East, New Zealand*, and the *Helvetic* and *Subaudic* mountains, sometimes detached, sometimes forming vast masses: colour green with a cast of blue, and in the prominent point of the fragments inclining to milk-white. By the inhabitants of the *East* and *New Zealand* it is fashioned into various ornaments, vessels and arms.



52. **LYDIUS.** Consisting of filica, a small quantity of lime, magnesia, oxyde of iron and inflammable matter: hard, lightish, opaque, compact, cinereous, black or greenish-black, stony, of a common form; breaking into indeterminate fragments, detached or constituting mountains: not fusible per se.

*siliceus.* Subopaque, of a splintery fracture, without internal lustre.

*Silex rupestris.* *Syst. nat.* xii. 3. p. 71. n. 15?

*Jaspis unicolor nigra.* *Wall. syst.* 1. p. 299. n. 1. g.

Siliceous Shiftus. *Kirwan. miner.* 1. p. 306.

Siliceous Shiftus. *Schmeisser miner.* 1. p. 127.

Keiselscheifer. *Thomson chem.* 3. p. 577.

Found in various parts of *Europe*, in blocks and amorphous masses of various sizes, and very often in the beds of rivers: colour blackish-grey or greenish, often intersected with veins of grey quartz or blood-red iron-stone: specific gravity from 2,596. to 2,641. contains filica 75,00. lime 10,00. magnesia 4,18. iron 3,54. inflammable matter 5,02. *Weigleb.*

*genuinus.* Of an even texture, sometimes approaching to the conchoidal, shining a little internally.

Basanite, Lydian stone. *Kirwan mineral.* 1. p. 307.

Touchstone. *Schmeisser mineral.* 1. p. 128.

Lydian stone. *Thomson chem.* 3. p. 578.

Found in the river *Tmolus* in *Lydia*, and in various parts of *Europe*, detached or in masses, and is commonly intersected by veins of quartz: colour dark greyish-black; its powder black: specific gravity 2,596. It is used as a touchstone to judge of the purity of metals.

53. **CHLOROGRANATUS.** Consisting of filica, a large proportion of oxyde of iron, and carbonate of lime, with frequently alumina: hard, never opake or subopake, crystallized: easily fusible in the fire.

*verus.*

Green, becoming honey-yellow in a white heat.

*Weigleb. Chem. annal.* 1788. 1. p. 200.

1. In double 8-sided pyramids, augmented at each point by another 3-sided pyramid.
2. In 6-sided prisms, terminating each side in a 3-sided pyramid.

Found in *Bohemia* near *Lichtewallestein*, in *Saxony* near *Ehrenfriedersdorf*, *Breitenbrunn*, *Eibenstein*, and *Schwartzenburg*, and in *Franconia* near *Ilmenau* on mount *Ehrenburg*: colour from leek to olive-green, sometimes diaphanous, sometimes pellucid, and often forms entire strata with layers of clay: frequently contains a fourth part of iron, and is used as a flux in iron furnaces: specific gravity from 3754. to 3757.

*dubius.*

Red, cubic.

*Wesstrumb Chem. annal.* 1789. 2. p. 26, &c.

Found ——— contains about a fifth part of carbonate of lime impregnated with carbonic acid gas, and about a tenth part of iron: crystals small, aggregate, seated on friable sandstone: may probably not belong to this genus.

54. **ARENA.** Consisting of comminuted siliceous stones: rough, hard, dry, in minute distinct granulations, not penetrable by water: not fusible per se, but melting with soda into glats.

*Sand.*

A. *Originating from comminuted Flint stones.*

*silicea.*

Composed of fragments of flint.

*Arena silicea.* *Syst. nat.* xii. 3. p. 199. n. 14.

Found in *Buckinghamshire* and other places.

B. *Composed of comminuted quartz.*

- Sabulum.* Consisting of angular unequal largers grains. *Gravel.*  
 Arena heterogenea. *Syst. nat.* xii. 3. p. 198. n. 9.  
 Arena faxosa. *Wall. syst. min.* 1. p. 106. n. 7.  
 Found every where on barren rocky mountains, and is produced by granite which has mouldered from exposure to the air, and is frequently found mixed with particles of mica, felspar and argil. It is principally used for gravel walks.
- micacea.* Shining with numerous interspersed small scales of mica, resembling thin plates of gold or silver in colour and lustre.  
 Arena micacea. *Syst. nat.* xii. 3. p. 198. n. 11.  
 Arena micacea. *Wall. syst. min.* 1. p. 105. n. 6.  
 2. Arena Casserita. *Syst. nat.* xii. 3. p. 198. n. 12.  
 Found in *Sweden* and *Germany*. 2) in the island *Casserita*, and is composed of comminuted granite and other like stones. It is the sand used to dry up the ink on newly written letters.
- rustica.* Consisting of roundish unequal larger grains.  
 Arena heterogenea. *Syst. nat.* xii. 3. p. 197. n. 8.  
 Arena quartzosa. *Wall. miner.* 35.  
 Common sand. *Schmeisser mineral.* 1. p. 337.  
 Found every where in *Europe*, principally upon shores, and contains some lamellar particles apparently of quartz. It is used for gravelling walks,
- colorata.* In rounded minute semitransparent grains tinged with oxyde of iron.  
 Arena quartzosa. *Syst. nat.* xii. 3. p. 196. n. 2.  
 2. Arena ochracea. *Syst. nat.* xii. 3. p. 197. n. 7.  
 3. Arena lacustris. *Syst. nat.* xii. 3. p. 197. n. 3.  
 Found in *South America* and *Europe*, principally on the shores of lakes: colour yellow, yellowish, or testaceous, rarely red, violet in the *Baltic* near *Germany*. It is used for sprinkling over letters, and makes admirable gravel walks.
- Glarea.* In very minute grains mixed with pulverised alumina.  
 Arena subfarinacea. *Syst. nat.* xii. 3. p. 197. n. 6.  
 Glarea partic. inequal. *Wallcr. syst.* 1. p. 87. n. 2.  
 2. Glarea sterilis fusoria. *Wall. min.* 31. 3.  
 Glarea partic. subtiliss. *Wall. syst.* 1. p. 86. n. 1.  
 Dust sand. *Gilt. Schmeisser miner.* 1. p. 336.

Found on barren commons and heaths: is very easily blown about when dry, but when wet is rather plastic and yields to the pressure of the hand. It is chiefly used in the beds and moulds where metals are cast.

*teraria.*

In larger equal round transparent whitish grains.

*Arena campestris.* *Syst. nat.* xii. 3. p. 197. n. 4.

*Arena quartzosa.* *Wall. syst. min.* 1. p. 103. n. 3.

2. *Arena margarita.* *Syst. nat.* xii. 3. p. 197. n. 5.

Found on barren heaths and woody commons, and is principally used in hour-glasses.

*mobilis.*

In very minute round transparent white grains.

*A. quartz. rotund. diaph. hyal.* *Syst. nat.* xii. n. 1.

*A. quartz. mobiliss.* *Wall. syst. min.* 1. p. 101. n. 1.

*Quicksand.* *Schmeissner miner.* 1. p. 336.

1. *A. quartz. vento volatilis.* *Syst. nat.* 1. n. 3.

2. *A. quartz. rotund. æqual.* *Syst. nat.* 1. n. 4.

3. *A. quartz. impalpab.* *Syst. nat.* 1. p. 208. n. 2.

Found in the sea and adjacent wastes, and is also thrown out from springs: when dry it is so light as to be driven about by the winds and collected into sand-banks, and often taken up in vast masses by whirlwinds, overwhelming and suffocating travellers and even whole villages: it is kept compact by the roots of the *Elymus arenarius*, *Arundo arenarius*, *Triticum repens*, and some species of Willow.

55. QUARTZUM. Consisting of silica, about 6 per cent. of alumina, and 1 per cent. of carbonate of lime: hard, lightish, brittle, shining internally, breaking into indeterminate fragments with acute margins, more commonly parasitical, found in mountains of all ages, mouldering in the air: not melting by fire alone, but with soda running into a hard pellucid glass. *Quartz.*

*fibrosum.*

Diaphanous, whitish, fibrous, with the fibres thicker and parallel, of a common form.

*Born. ind. foss.* 1. p. 21. 2. p. 92.

*Fibrous Quartz.* *Kirwan. mineral.* 1. p. 245. var. 5.

Found on the *Carpathian* mountains in *Hungary*, and near *Rabibschau* in *Silesia*; exceeding rare.

*foveolatum.* With the surface uneven by shallow pits, of a common form.

Found in *Hungary*, *Bohemia*, near *Freyburg* and *Schneeberg* in *Saxony*, and in the quarries of *Sweden*: colour generally whitish, rarely violet or ochraceous; mostly diaphanous, though sometimes opaque: the pits or hollow very numerous and cubic, rarely parallelepiped or trieco-pyramidal, or spherical or tabular.

*foraminulentum.* Perforated with deep rounded hollows, of a common form.

*Karsten Leske mineral.* 1. p. 98, 99.

Found near *Freyburg* in *Saxony*, and near *Schemnitz* in *Hungary*: colour white, greyish, or ochraceous: the hollows generally narrow, and sometimes flexuous.

*erosum.* Full of numerous very minute empty hollows and cavities, of a common form.

*Born. ind. foss.* 1. p. 26.

Found in the mines of *Hungary*; white, violet, or dull greenish.

*cellulosum.* Lamellar, with the plates contiguous, placed at various angles with each other and forming cells, of a common form.

*Born ind. foss.* 1. p. 25. *Karsten Leske.* 1. p. 19. 98.

Cellular quartz. *Kirwan miner.* 1. p. 244.

Cellular quartz. *Jameison mineral.* 1. p. 153.

- a. With simple 3-sided cells.
- b. With simple 4 sided cells.
- c. With simple 6-sided cells.
- d. With simple many-sided cells.
- e. With simple rounded cells, sometimes minute like sponge.
- f. With simple cells passing into gyrations.
- g. With double cells.

Found in *Siberia* near *Catbarinopolis*, in *Hungary* near *Chennnitz* and *Neosolium*, in *Bohemia* near *Joachimsthal*, in *Saxony* near *Schneeberg* and *Freyburg*, and the *Palatinate*: colour sometimes white, sometimes more or less tinged with oxyde of iron.

*lamellosum.* Lamellar, with the plates parallel, of a common form.

Quartz. fissile lamellat. *Syst. nat.* xii. 3. p. 66. n. 5?

*Born. ind. foss.* 1. p. 25. 2. p. 91.

Lamellar quartz. *Kirwan miner.* 1. p. 244.

Lamellated quartz. *Schweisser miner.* 1. p. 93.

Found near *Schemnitz* in *Hungary*, and in the mines of *Bohemia*: colour milk-white, white, violet, or brown: rarely yellow and blue: the foliations are sometimes very thin and compacted together.

*cristatum*. The surface marked with very fine parallel grooves, of a common form.

*Karsten Leske mineral*. 1. p. 98. *Born. ind.* 1. p. 25. 2. p. 91.

Found in the mines of *Saxony* and *Hungary*: colour white, violet, or yellowish brown.

*globulosum*. Of a more or less rounded form, pellucid.

Quartz. select. vagum. *Syst. nat.* xii. 3. p. 66. n. 7, 8.

Quartz in roundish grains. *Jameison miner.* 1. p. 153.

1. Of a more or less perfectly globular form,

Compact.

Hollow within.

Compressed.

2. Of a more or less perfectly oval form.

3. Resembling an almond in figure.

4. Kidney-form.

5. Tuberous.

Found detached in the beds or banks of rivers in various parts of *Europe*, *Asia*, and *Africa*; or compacted with other fossils in *Hungary*, *Saxony*, &c. colour generally white.

*cylindricum*. Separating into cylindrical pieces.

*Karst. Leske mineral*. 1. p. 105, 106.

*Born. ind. foss.* 1. p. 25.

1. With the cylinders parallel.

2. With the cylinders diverging.

Found near *Schemnitz* in *Hungary*, in *Saxony*, and in other parts of the continent: colour white, subopaque, with the cylinders thinner or thicker.

*granulare*. Separating into granular fragments,

*Karst. Leske mineral*. 1. p. 106.

Granular quartz. *Kirwan miner.* 1. p. 245.

Quartz in grains. *Schmeisser miner.* 1. p. 93. d.

Found commonly in small grains, sometimes detached, sometimes compacted together, in *Norway*, *Spain*, *France*, and *Saxony*: colour white, variegated, greenish, red, or yellow-brown: the grains are sometimes so disposed as to reflect a fine splendour when polished.

*stallitium*. Gradually deposited by water impregnated with particles of quartz, and often covering other bodies as with a bark.

Stalact. quartzof. granulat. *Syst. nat.* xii. p. 185. n. 9.

Stalactitic quartz. *Kirwan mineral*. 1. p. 245.

Stalactitical quartz. *Schmeisser miner.* 1. p. 94.

Found at *Breiback* on the *Hacksburg* in the bishopric of *Cologne*, in *Iceland*, *Sweden*, and *Hungary*: colour diaphanous, generally white, sometimes yellowish or reddish; and appearing in the form of solid or hollow cones, or in that of roses, cauliflowers, grapes, &c.

*fragile.*

Of a common form and splintery texture, not falling spontaneously into fragments.

1. Nearly opaque.

Quartz. opac. rupest. *Syst. nat.* xii. 3. p. 66. n. 4.

Quartzum fragile rigidum. *Wall. syst.* 1. p. 213.

Quartzum purum. *Cronst. min. sect.* 51. B.

2. Diaphanous, milky-white.

Quartzum lacteum. *Syst. nat.* xii. 3. p. 65. n. 3.

Quartzum solid. opac. *Wall. syst.* 1. p. 213.

Found almost every where in the fissures of rocks and mountains; sometimes opaque, sometimes diaphanous, rarely transparent; colour mostly white, sometimes milky, frequently pale greenish or red.

*Præius.*

Leek-green, diaphanous, of a coarse splintery texture.

Achates pellucida. *Wall. syst.* 1. p. 297. n. 18.

Prasum. *Kirwan miner.* 1. p. 249.

Smaragdum. *Cronst. min. sect.* 73. 2.

Prase. *Schmeisser* 1. p. 97. *Thomson chem.* 3. p. 519.

Prase. *Jamieson mineral.* 1. p. 157.

Found at *Schwarzenburg* in *Saxony*, in *Finland*, *Siberia*, and *Bohemia*; either in irregular masses, or crystallized in 6-sided pyramids, or in small 6-sided tables superimposed one on the other, sometimes in slender needle-like crystals: colour green of various degrees of density, sometimes yellowish or bluish-green: when broken it is shining and of a coarse shivery texture, sometimes approaching to the imperfectly small conchoidal. admits a degree of polish, and is frequently numbered among the gems.

*pingue.*

Of a common form, slightly greasy to the touch, approaching to the minutely conchoidal texture, not falling spontaneously into fragments.

Pure Quartz. *Kirwan miner.* 1. p. 242.

Quartz. *Schmeisser mineral.* 1. p. 92.

Common Quartz. *Jamieson mineral.* 1. p. 152.

Quartz. *Thomson chem.* 3. p. 517.

1. Pellucid. Quartz. hyal. *Syst. nat.* xii. 3. p. 65. n. 1.

Quartzum pellucidum. *Wall. syst.* 1. p. 212. n. 3.

2. Diaphanous. *Wall. syst.* 1. p. 212. n. 2.

3. Coloured. *Syst. nat.* xii. 3. p. 65. n. 2.

Quartzum coloratum. *Wall. syst.* 1. p. 213. n. 5.

Found distributed in most parts of the globe, frequently in the native oxydes of metals and minerals, sometimes forming whole rocks, and sometimes in beds and veins: of various degrees of transparency and colour, but generally white or greyish: specific gravity from 26,4. to 26,5.

*tabulare.* Of a conchoidal texture, in tabular crystals.

*Hoffmann Berg. Journ.* 1788. 1. p. 274.

Found near *Schemnitz* in *Hungary*, and near *Freyburg* in *Saxony*: colour generally white, rarely dull greenish: the tables are mostly rhombic, though sometimes found 3-sided.

*cubicum.* Of a conchoidal texture, in cubic crystals which are frequently hollow within.

1. With the faces square.

*Born. ind. foss.* 1. p. 21. *Karst. Lesk. min.* 1. p. 104.

*Hoffmann Berg. Journ.* 1788. 1. p. 275.

2. With the faces rhombic.

*F. Born. ind. foss.* 2. p. 89. *Karst. Lesk. min.* 1. p. 104.

Found in *Sweden*, *Hungary*, *Saxony*, and *Bohemia*, generally in aggregate crystals which seem to have acquired their form from some other crystal which it had enveloped, and which had gradually mouldered, leaving a hollow in its place: colour white, hoary, margaritaceous, or brown-red; pellucid, diaphanous, or nearly opaque.

*octaedricum.* Of a conchoidal texture, in a double 4-sided pyramid.

*Hoffmann Berg. Journ.* 1788. 1. p. 275.

Found near *Schneeberg* in *Saxony*, sometimes hollow within: colour the same as *Q. cubicum*.

*tridrum.* Of a conchoidal texture, in a simple 3-sided pyramid.

*Born. ind. foss.* 2. p. 88, 89.

Found near *Hälskull* in *Sweden*, near *Schneeberg* in *Saxony*, in aggregate crystals which are sometimes hollow: lustre frequently pellucid: colour reddish or white.

*pyramidale.* Of a conchoidal texture, in a single 6-sided pyramid transversely striate.

*Sowerby Brit. min.* 2. tab. 102.

*Karsten Leske mineral.* 1. p. 102, 103.

1. With the pyramid perfect.

*Born. ind. foss.* 1. tab. 2. fig. 10.

2. With the pyramid truncate at top.

*Born. ind. foss.* tab. 2. fig. 2.

3. With an additional 6-sided pyramid at top.

4. With an additional 6-sided pyramid at the top and the base.



Found in various parts of England and Scotland, in Switzerland, Hungary, Silesia, Bohemia, and Saxony; more commonly pellucid than opaque: colour mostly white, sometimes pale red, yellowish or yellowish-red; the crystals generally in grains, sometimes resembling a kidney or a gem.

*Pseudodiamond.*

Of a conchoidal texture, in a double sided pyramid, not striate.

1. With the pyramid perfect.

Nitrum crystallus. *Syst. nat.* xii. 3. p. 84. n. 2. c.

*Sæverby Brit. min.* 1. tab. 41, 42.

*Gmel. syst. nat.* 3. p. 445. tab. 1. f. 3.

2. With the margins of the common base truncate.

*Gmel. syst. nat.* 3. p. 445. tab. 1. f. 2.

- a. Regular.

Nitrum crystallus. *Syst. nat.* xii. 3. p. 84. n. 2. d.

- b. With all the faces unequal.

*Born. ind. foss.* 1. p. 25. tab. 2. f. 43.

- c. With the common base oblique.

3. Pellucid. *Bocc. mus. tab.* 304. Iris.

Pellucid with opaque particles included

4. Opaque.

Found near Bristol and Buxton, in Cornwall, Derbyshire, and Northumberland, and various parts of Europe: colour mostly white, sometimes reddish or blackish; rarely hollow within: the crystals sometimes detached, sometimes clustered and adhering together in various forms.

*Crystallus.* White, pellucid, of a conchoidal texture, in a 6-sided transversely striate prism.

Nitrum lapidosum. *Syst. nat.* xii. 3. p. 84. n. 2.

Crystallus montana. *Wall. syst.* 1. p. 217. n. 9.

*Scheuchz. it.* 243. t. 6. *Wolf, Hafs.* 1. 1. f. 1. 4. 6.

*Gesn. fig.* 18. f. 1, 2. *Rumph. mus.* 1. 52. f. 5. 3. 4.

Rock crystal. *Kirwan* 1. p. 241. *Schmeisser min.* 1. p. 82.

Rock or mountain crystal. *Jameison min.* 1. p. 143.

1. With the prism obliquely truncate.

*Born. ind. foss.* 2. p. 89. tab. 1. f. 4.

2. With the prisms terminating at one end in a 3-sided pyramid.

*Born. ind. foss.* 2. p. 89. *Karst. Lesk. min.* 1. p. 102.

3. With the prisms terminating at one end in a 6-sided pyramid not striate.

*Wall. syst. min.* 1. p. 217. n. 9. a.

- a. The pyramid common to the two prisms.

- b. The pyramid double. *Born. ind.* 1. *tab.* 2. *f.* 9.
  - c. The pyramid regular.
  - d. The pyramid with the alternate faces larger.
  - e. The pyramid with one face larger than all the others.  
*And. Br. a. d. Schweiz tab* 11. *f.* h.
  - f. The pyramid with all the faces unequal.
4. The prisms terminating at each end in a 6-sided pyramid not striate. *Gmel. syst. nat.* 3. *p.* 445. *t.* 1. *f.* 1.
    - a. With the faces equal.
    - b. With the faces unequal.
  5. The prisms with straight margins.
  6. The prisms with all or some of the margins twisted outwardly towards the base. *Syst. nat.* xii. 3. *p.* 84. *n.* 2. b.
  7. The prisms with all the faces unequal.
  8. The crystal solid.
  9. The crystal hollow within.  
Nitrum inane. *Syst. nat.* xii. 3. *p.* 85. *n.* 4.  
*Amæn. acad.* 1. *p.* 478. *n.* 14. *tab.* 16. *f.* 12.  
*Wall. syst. min.* 1. *p.* 218. *n.* 9. d.
    - a. The hollow of the crystal empty.
    - b. The hollow inclosing a bubble of air, a drop of water, a lesser crystal, or some other fossile.
  10. The crystal with a thicker prism seated on a thinner.  
*Born. ind. foss.* 1. *p.* 22. *tab.* 2. *f.* 4.
  11. The thinner prism with a double broader pyramid placed on it, with 2 intermediate unequal globules.  
*Born. ind. foss.* 1. *p.* 23. *tab.* 2. *f.* 6.
  12. The crystals solitary.
    - a. Detached.
    - b. United at the base.
  13. The crystals in pairs or 3 together.
    - a. The base of the prism of each crystal cohering.
    - b. Pearl-like, cohering.
    - c. Mutually perforating each other.
  14. Aggregate. *Syst. nat.* xii. 3. *p.* 84. *n.* 2. f.  
*Amæn. acad.* 1. *p.* 477. *n.* 10. *tab.* 16. *f.* 6.
    - a. In series.
    - b. Fascicled.

- c. Convergent. *Born, ind. foss. 1. tab. 2. f. 16.*
- d. Decumbent.
- e. Seated in the manner of the prickles of an echinus upon a larger crystal or other fossil.
- f. Imbricate.

Found in almost every part of the globe, particularly in alpine situations, and is almost exclusively confined to primitive rocks, especially granite and mica slate: colour various shades of white, brown, red, and yellow, sometimes mixed together: fragments indeterminately angular, with very sharp edges: does not lose its transparency in the fire: causes double refraction: specific gravity from 2,650. to 2,888. contains silica 93,0. alumina 6,0. lime 1,0. *Bergman.*

*Pseudogem-* Coloured, pellucid, of a conchoidal texture, in a 6-sided  
*ma.* transversely striate prism.

Nitrum fluor. *Syst. nat. xii. 3. p. 85. n. 3.*

Crytallus montana. *Wall. syst. miner. 1. p. 220. n. 10.*

1. Blackish. *Baum. miner. 1. p. 232. n. 2.*
2. Clove-brown. *Wall. syst. 1. p. 222. n. 10. h.*
3. Red. *Wall. syst. 1. p. 221. n. 10. a.*
4. Fulvous. *Wall. syst. 1. p. 222. n. 10. e.*
5. Yellow. *Wall. syst. 1. p. 222. n. 10. d.*
6. Leek-green. *Wall. syst. 1. p. 222. n. 10. g.*
7. Grass green. *Wall. syst. 1. p. 222. n. 10. f.*
8. Sky-blue. *Baum, miner. 1. p. 236.*
9. Deep blue, *Baum. miner. 1. p. 231.*

Found chiefly in veins abounding in rock crystal, of various degrees of magnitude and transparency: they are often sold for gems, but may easily be distinguished by the different form of their crystals and by their lesser degree of hardness and lustre: they yield to the file, and like the rock crystal, when two pieces are rubbed hard together, they emit a phosphorescent light in the dark, and exhale a peculiar empyreumatic odour.

*Amethystus.* Violet-blue, varying in texture, form and degrees of transparency.

Nitrum violaceum. *Syst. nat. xii. 3. p. 85 n. 3. d.*

Crytallus violacea. *Wall. syst. 1. p. 221. n. 10. b.*

Amethyst. *Kiawan mineral. 1. p. 246. Schmeisser 1. p. 96.*

Amethyst. *Jameison. 1. p. 137. Thomson chem. 3. p. 518.*

Found in *Mexico, Ceylon, Sweden, Bohemia, Saxony*, and other parts of *Europe*, in veins of primitive rocks, and sometimes in agate balls and kidneys in porphyry: colour violet-blue in various degrees of intensity, sometimes greenish, rarely white: texture conchoidal, fibrous, granular, or splintery: lustre various degrees of transparency to nearly opaque: crystals simple 6-sided pyramids, or with faces of different sizes, the planes of which are smooth: yields to the file, is brittle, and easily frangible: specific gravity 2,750. contains silica 97,50. alumina 0,25. oxyde of iron with a trace of manganese 0,50. *Rose.*

*Pseudocrystallus.* Opaque, in a 6-sided prism terminating at one or both ends in a 6-sided pyramid.

Nitrum opacum. *Syst. nat.* xii. 3. p. 85. n. 3. 2.

Quartzum rude. *Wall. syst.* 1. p. 216. n. 8.

Found in *Hungary, Bohemia, Saxony, Sweden, and Barbary*: the crystals sometimes detached, sometimes united: colour various degrees of white, black, red, or variegated.

56. CHALCEDONIUS. Consisting of silica, a small quantity of alumina with sometimes about a tenth of lime, and a slight trace of oxyde of iron: hard, lightish, shining within, breaking into indeterminate fragments with sharp edges, compact, not mouldering in the air, of a more or less perfectly conchoidal texture, never opaque, tough, admitting a high polish, and generally of a common form: not melting before the blowpipe.

*Cacholoni* Milk-white, somewhat diaphanous, becoming opaque in the fire.

Achates opalina. *Wall. syst.* 1. p. 272. n. 13.

Kachelony. *Cronst. mineral. sect.* 57. 3. a.

Cacholony. *Schmeisser mineral.* 1. p. 106.

Found in the rivers *Bucharest* and *Mongool*, and the *Feroe islands*, where it lies between the strata of semitransparent Chalcedony. It is never found in drops or stalactitical. The Kalmucs make their idols and domestic vessels of it.

*genuinus.* Grey, of a flat texture and common form, not falling spontaneously into fragments.

Silex vagus. *Syst. nat.* xii. 3. p. 69. n. 8.

Achates. *Wall. syst. min.* 1. p. 275. n. 15.

Calcedony. *Kirwan* 1. p. 297. *Schmeisser min.* 1. p. 105.

Chalcedony. *Thomson chem.* 3. p. 530. *Jameison.* 1. p. 174.

Found in *Cornwall*, and the islands of *Scotland*, in *Iceland*, *Silesia*, the *Ferœ islands*, *Saxony*, and *Siberia*, in various shapes, kidney-shaped, stalactitical, globular, botryoidal, like hollow pebbles often containing air bubbles or drops of water; also in angular pieces and veins in porphyry and amygdalite, and sometimes cubic: colour various shades of grey, with sometimes a tinge of green or blue: lustre generally semitransparent rarely diaphanous: the surface is rough; fracture perfectly even, though sometimes passing into the fine splintery or imperfectly conchoidal: specific gravity from 2,586. to 2,655. contains silica 84. alumina mixed with iron 16. *Bergman*.

*cæruleus*. Blue, of a flatter texture, semipellucid, of a common form, not falling spontaneously into fragments.

Found in the *Ferœ islands*, the shores of *Scotland*, in *Saxony*, *Bohemia*, *Hungary*, and *Transylvania*: colour sometimes verging to cinereous or milky, sometimes clear sky-blue, or between violet and lavender-blue, or sapphirine: in other respects it resembles the last.

*niger*. Black, dull red when opposed to a strong light, of a flatter texture, somewhat diaphanous.

*Hoffman. Berg. Journ.* 1787. 1. p. 283.

Found near *Chemnitz* in *Saxony*, imbedded in Porphyry.

*fuscus*. Brown, of a texture sometimes flatter sometimes conchoidal, diaphanous.

*Carneolus fuscus. Wall. ffl.* 1. p. 274. e.

Found detached at the river *Tom* in *Siberia*, and near *Chemnitz* in *Saxony*, imbedded in Porphyry.

*luteus*. Pale yellow, of a flat texture verging to the conchoidal.

*Carneolus flavescens. Wall. ffl.* 1. p. 273. d.

Found detached near the river *Tom* in *Siberia*, and in *Ceylon*, *Hungary*, and *Saxony*: colour sometimes wine-yellow, sometimes wax or honey-yellow.

*Carneolus*. Blood-red, semitransparent, of a perfectly conchoidal texture.

*Silex ruber. Syst. nat.* xii. 3. p. 69. n. 9.

*Carneolus. Wall. fyst.* 1. p. 273. n. 14.

*Carnelian. Schmeisser* 1. p. 107 *Kirwan* 1. p. 300.

*Cornelian. Thomson chem.* 3. p. 531.

Found in *Arabia* and *Hindustan*, *Egypt* and various parts of *Europe*, generally in roundish pieces, and also in layers in *Agate*: colour various shades of red: rarely opaque, and sometimes turbid with a few cloudy shades: outer surface rough and uneven, the fragments indeterminately angular and sharp-edged: specific gravity from 2,630. to 2,700.

- Sardus.** Pale, variegated with blood-red dots and drops.  
*Silex vagus.* *Syst. nat.* xii. 3. p. 68. n. 5.  
*Caenocolus albescens.* *Wall. jyst.* 1. p. 274. n. 14. f.  
*Sardoine.* *Schmeißer miner.* 1. p. 110.  
 Found in *India, Sardinia*, near *Oberstein* in the *Palatinate*: colour grey, or a little milky, rarely brown.
- dendriticus.** Pale, painted with deeper-coloured arboreſcent ramifications.  
*Mocha ſtone.*  
*Achates figuratus.* *Wall. jyst.* 1. p. 285. n. 22. 1.  
 Found in the *East, Iceland*, the *Palatinate* of the *Rhine*, and other parts of *Europe*: colour white or grey with ſhrub like black, brown, red, or green pictures: thoſe of the *East* are eſteemed very valuable.
- maculatus.** Marked with ſpots differing in colour and in degree of transparency.  
*Plasma.* *Thomſon chem.* 3. p. 531. *Jameſon min.* 1. p. 189.  
 Found in *Ceylon*, the *Feroe iſlands*, *Italy*, and the *Palatinate*: colour wine-yellow with darker ſpots, perlaceous or yellowiſh-brown with milk-white ſpots diſpoſed in rings, milk-white with black or red ſpots, blood-red with brown or white ſpots, or grey, graſs-green, or olive-green variegated with ſpots of a reddiſh or whitish colour.
- fasciatus.** Marked with bands differing in colour and degree of transparency.  
*Sardonyx.* *Schmeißer miner.* 1. p. 111.  
 Found in *Ceylon, Feroe and Iceland, Bohemia* and *Saxony*: colour grey, ſomewhat pellucid, with milk-white diaphanous bands, rarely with thoſe that are roſy or green, or blueiſh or blood-red with white or grey bands; the bands are narrower or broader, of equal or unequal width, parallel, confluent, ſtraight, angular or undulate.
- Onyx.** Breaking into concentrically cruſtose fragments differing in colour and degree of transparency.  
*Silex vagus.* *Syst. nat.* xii. 3. p. 69. n. 7.  
*Achates.* *Wall. jyst. min.* 1. p. 276. n. 16.  
*Onyx.* *Schmeißer mineral.* 1. p. 108.  
 Found in the *East Indies, Siberia, Bohemia, Portugal* and *Saxony*, in thicker or thinner fragments, and ſometimes in pebbles: colours grey and black, white fleſh-colour and black, red and white, white and grey, various ſhades of yellow, alternating in various manners, generally in concentric circles: it loſes its colour in the fire, and cracks and breaks if the heat be ſudden or violent: it is the hardeſt of all its genus: ſpecific gravity from 2,500, to 2,600.

*stillatitius.* Precipitated from water highly charged with its particles.

1. Inclosing or incrusting Lichens and other vegetable substances.
2. Inclosing or incrusting crystals, and hence having the appearance of crystals.
3. In knotty hollow kidney-form or botryoidal globular pieces.
4. In solid or hollow cylinders.

Found in the *Feroe islands*, *Iceland*, *Bohemia*, *Saxony*, and many other parts of the continent: texture sometimes approaching to the fibrous.

*crystallinus.* Blueish, in the form of 6-sided divergent prisms.

*Fichtel von Karpath.* p. 138.

Found in a valley near *Tatareschol* in *Transylvania*, imbedded in yellow Jasper.

*viridis.* Green, semitransparent, of a flatter texture.

Found, though rarely, in the *Feroe islands*: colour generally grass-green, though sometimes approaching to the æruginous.

*Chrysoprasus.* Green, with hardly any internal lustre, semitransparent, of a flatter texture.

Nitrum fluor. *Syst. nat.* xii. 3. p. 85. n. 3. g.

Achates prasius. *Wall. syst.* 1. p. 262.

Chrysoprasium. *Kirawan miner.* 1. p. 283.

Chrysopras. *Jameis. min.* 1. p. 191.

Chrysoprase. *Thomson chem.* 3. p. 518. *Schmeisser* 1. p. 113.

Found in *Germany*, particularly near *Kosmetz* in *Silesia*, in *Bohemia* and *Westphalia*, generally in solid masses, sometimes in loose pebbles, or layers of asbest, talc, lithomarg. and iron ochre; internally it is dull; is hard, but does not strike fire with steel: colour various shades of apple-green, rarely grass, leek or olive-green, very rarely greenish-grey or marked with brown spots: in a heat of 130° of wedgewood it whitens and becomes opaque, but does not melt before the blowpipe: specific gravity 3,250. contains silica 96,16. oxyde of nickel 1,00. lime 0,83. alumina 0,08. oxyde of iron 0,8. *Klaproth.*

*Heliotropius.* Diaphanous, of a conchoidal texture, green marked with opaque blood-red dots and drops.

Jaspis Heliotropius. *Wall. syst.* 1. p. 300. n. 2. g.

Heliotrop. Blood-stone. *Schmeisser mineral.* 1. p. 116.

Heliotropium. *Kirawan mineral.* 1. p. 314.

Heliotrope. *Jameis.* 1. p. 187. *Thomson chem.* 1. p. 531.

Found in *Asia*, *Persia*, *Siberia*, *Iceland*, *Bohemia*, and *Franconia*, in rocks of trap: colour various shades of green, sometimes marked with ochraceous spots or lines: texture more or less perfectly conchoidal: specific gravity from 2,620. to 2,700.

57. ADAMAS. Consisting of silica and carbon: slightly ponderous, extremely hard, lamellar, exhibiting a high peculiar lustre, breaking into indeterminate fragments, parasitical, shining in the dark after being exposed to the rays of the sun, attracting light bodies when rubbed or heated: crackling and losing its transparency in the fire, and at 14 or 15° of wedgewood begins to burn, and at length entirely evaporates.

preciosissimus.

## ADAMAS.

Diamond.

Alumen lapidosum. *Syst. nat.* xii. 3. p. 102. n. 6. a.

Gemma pellucidissima. *Wall syst.* 1. p. 230. n. 1.

Diamond. *Kirwan miner.* 1. p. 393. *Jameison.* 1. p. 22.

Diamond. *Schmeisser mineral* 1 p. 220.

1. Crystallized in the form of prisms.
2. The prisms 6-sided, ending both sides in a 3-sided pyramid, with all the faces convex.
3. The prisms 6-sided, ending both sides in a 6-sided pyramid.
4. The prisms 8-sided, ending in an irregular truncate pyramid, with the faces of the prisms themselves unequal.
5. The prisms 8 sided, with the terminal faces ending in needle-like points.
6. Crystallized in the form of double 4-sided pyramids.
7. Crystallized in the form of 3-sided depressed rough pyramids with convex faces, augmented with a 4-sided pyramid at each angle of the common base.
8. In a rounded form.

Found in *Borneo*, the provinces of *Golconda* and *Visapour*, and at the foot of the *Orixia* mountains in *Bengal*, in *South America*, in the district of *Serra do frio* in *Brazil*, generally in loose sand or inclosed in a loamy earth, very rarely aggregate or attached to other fossils: of all mineral substances it possesses far the greatest degree of hardness, transparency and lustre; fracture straight and perfectly foliated: it is either colourless, or red, greenish, yellowish, brownish, black, or steel blue, with sometimes specks and clouds. It is of all gems the most precious, and from its entirely consuming like an inflammable substance, may probably be considered as a very pure species of coal.



## ORDER VI. ADAMANTINE.

*Consisting principally of corunda or adamantine earth.*

58. ADAMANTINUS. Consisting of adamantine earth, the greater part alumina, a little silica and iron: very hard, ponderous, lamellar with straight foliations intersecting each other in a 3-fold manner, breaking into rhomboidal fragments: perfectly apyrous, and yielding a little to the file.

*Corundum.* ADAMANTINUS.

Corunda. *Klaproth. Chem. annal.* 1789. 1. p. 7.

Adamantine earth. *Kirwan mineral.* 1. p. 17.

Adamantine spar. *Schmeißer miner.* 1. p. 57.

Diamond spar. *Jameison miner.* 1. p. 93.

Imperfect Corundum, *Thomson chem.* 3. p. 507.

Found in *China, Bombay, France, and Spain*, in granite: colour grey, with often various shades of green, blue and brown: lustre transparent, and when polished shines like mother of pearl: is sometimes found massive, but most commonly in 6-sided prisms, and simple acute 6-sided truncated pyramids: it is used like diamond powder for cutting and polishing hard minerals: specific gravity 3,981. contains corunda and alumina 84,00. silica 6,50. oxyde of iron 7,50. *Klaproth.*

## ORDER VII. AGGREGATE.

*Composed of a mixture of the former orders.*

59. GRANITES. Consisting of parts, mostly in the form of crystals, cohering without any intermediate cement, and mixed without any determinate order; generally of a granular texture, hard and durable, and admitting a fine polish: constituting the principal material and nucleus of primitive lofty mountains.

*simplex.*

Consisting of feldspar and quartz.

Saxum morense. *Syst. nat.* xii. 3. p. 75. n. 14.

Found in the *Subaudic, Saviss, Siberian, and Scotch* mountains, and detached near *Geneva*: the component parts vary as to their predomination, but the particles of feldspar are sometimes so combined with transparent quartz as to resemble Syriac letters.

*genuinus.*

Consisting of feldspar, quartz, and mica.

Saxum spatiosum. *Syst. nat.* xii. 3. p. 76. n. 19.

Saxum quarzo, &c. *Wall. syst.* 1. p. 407.

Granit. *Schmeissier mineral.* 1. p. 308.

Granite. *Kirawan mineral.* 1. p. 338. *Thomson chem.* 4. p. 130.

The most common kind of granite, and is found in primitive and sometimes in secondary mountains in most parts of the globe, in innumerable varieties of hardness, proportion, distribution and colour of parts: sometimes it is found mixed with other minerals, as shorl, hornblend, crystals of garnet, steatite, and alumina: it melts in a high degree of heat, leaving however the quartz unaltered: the feldspar is often flesh-colour; the quartz generally white, rarely greenish: it takes a very high polish, and on this account has for many ages been used in the architecture of columns, palaces, churches, and various ornaments.

*Syenites.*

Consisting of feldspar, quartz, and hornblend.

Syenites. *Plin. Hist. mund.* l. 36. ch. 8?

Sienit. *Schmeissier miner.* 1. p. 309.

Sienite. *Kirawan min.* 1. p. 341. *Thomson chem.* 4. p. 135.

Found in *Egypt, Greece, Norway, Saxony, &c.* sometimes in large masses, sometimes in smaller granulations: the component parts vary much, but the hornblend and feldspar generally predominate, and the quartz in very small proportion: the colour of the feldspar and quartz is generally white, and the hornblend black or black-green.

- scorlinus.* Consisting of feldspar, quartz, and shorl.  
 Granites basalt. *Anon. Chem. annal.* 1785. 2. p. 21.  
*Edelfeld. nov. Act. Stockh.* 1784. p. 103.  
 Found commonly in the mountains of *Sweden, Silesia, and Switzerland.*
- granaticus.* Consisting of feldspar, quartz, and garnets.  
*Edelfeld. nov. Act. Stockh.* 1784. p. 103.  
 Found in the *Swiss and Swedish* mountains.
- viridis.* Consisting of feldspar, quartz, and amarus.  
 Found commonly in the mountains of *Switzerland.*
- talcosus.* Consisting of feldspar, quartz, and talc.  
*Anon. Chem. annal.* 1785. 2. p. 23.  
 Found near *Linz* in *Upper Austria.*
- micaceus.* Composed of feldspar and mica.  
*Sauss. Voy. dans les alp.* 1. p. 183.  
*Syst. nat.* xii. 3. p. 76. n. 21.  
 Granites fuscus. *Wall. syst.* 1. p. 409. n. 3. k.  
 Found very rarely in *Switzerland* and *Silesia*, in *Finland* and *Goibland*, and detached near *Geneva* and *Vesuvius.*
- calcareus.* Composed of feldspar and calcareous spar.  
*Given. litolog. Vesuv.* p. 49. 51. 71.  
 Found in the neighbourhood of *Vesuvius*, brittle, not hard, effervescent with acids, and sometimes containing small portions of scorl, mica, alumina,
- grandævus.* Composed of mica and hornblend.  
 Saxum micaceum. *Syst. nat.* xii. 3. p. 79. n. 35.  
 2. Blueish-green. *It. scan.* 21.  
 Found sometimes in large rocks, in various mountains of *Switzerland, Sweden, and Bohemia*, frequently rich in veins of iron; the dull greenish variety is generally used in some parts of *Sweden* as a flux for iron ore.
- scorlaceus.* Composed of feldspar and shorl.  
*Hoefn. magaz. Helv. natur.* 1. p. 279.  
 Found in the mountains of *Switzerland* and near *Vesuvius*, sometimes containing mica or hornblend.

- squamosus.* Composed of feldspar and hornblend.  
*Hoefn. magaz. Helv. natur.* 1. p. 271.  
 Found in the mountains of *Switzerland* and in *Zeeland*, often containing a small quantity of mica or shorl.
- granatinus.* Composed of feldspar and garnets.  
*Gioeni litolog. Vesuv.* p. 68.  
*Hoefn. magaz. Helv. natur.* 1. p. 179.  
 Found in the mountains of *Switzerland*, in *Zeeland*, and the neighbourhood of *Vesuvius*.
- nitens.* Composed of feldspar, garnets, and mica.  
*Hoefn. magaz. Helv. natur.* 1. tab. 3.  
 Found in the mountains of *Switzerland*.
- tricolor.* Composed of feldspar, garnets, and shorl.  
*Gioeni litolog. Vesuv.* p. 64. 67.  
 Found in the neighbourhood of *Vesuvius*.
- dichrous.* Composed of feldspar, granatine, and common shorl.  
*Gioeni litolog. Vesuv.* p. 70. 75.  
 Found in the neighbourhood of *Vesuvius*.
- albo-fuscus.* Composed of feldspar, granatine, shorl, and mica.  
*Gioeni litolog. Vesuv.* p. 71.  
 Found round *Vesuvius*.
- elegans.* Composed of feldspar, garnets, and actinote.  
*Gioeni litolog. Vesuv.* p. 69.  
 Found in the neighbourhood of *Vesuvius*.
- micans.* Composed of feldspar, mica, and shorl.  
*Gioeni litolog. Vesuv.* p. 73. 75.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
 Found in the mountains of *Switzerland*, and in *Vesuvius*, sometimes the mica sometimes the shorl predominating, in larger or less particles; garnets are sometimes found immersed.
- lamellosus.* Consisting of feldspar, mica, and shorl.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
 Found in the mountains of *Switzerland*, sometimes one sometimes the other ingredient predominating, and mixed in larger or less particles.
- cretaceus.* Consisting of feldspar, mica, and chalk.  
*Gioeni litolog. Vesuv.* 1. p. 45.  
 Found in the neighbourhood of *Vesuvius*.
- Gioeni.* Consisting of feldspar, garnets, and hornblend.  
*Gioeni litolog. Vesuv.* p. 75.  
 Found about *Vesuvius*.

- varius.* Consisting of feldspar, actinote, and fluor. *Gioeni litolog. Vesuv. p. 62, 63.*  
Found round *Vesuvius*, exhibiting prisms or foliations by an intermixture of black mica or hornblend.
- leucomelas.* Consisting of feldspar, actinote, and hornblend. *Gioeni litolog. Vesuv. p. 63.*  
Found in the neighbourhood of *Vesuvius*.
- muraticus.* Consisting of feldspar, mica, and amarus. *Hoepfn. magaz. Helv. natur. 1. tab. 3.*  
Found in the mountains of *Switzerland*.
- serpentinus.* Consisting of feldspar, serpentine, and quartz. *Fichtel Karpath. p. 310.*  
Found in the mountains of *Transylvania*, and easily moulders into alumina.
- Garpenbergensis.* Consisting of the greater part quartz and mica. *Saxum cotaceum. Syst. nat. xii. 3. p. 75. n. 18?*  
*Saxum compositum, &c. Cronq. min. syst. 260. 2. 1.*  
2. With the foliations of silvery or gold mica so interspersed, as to exhibit a rich lustre when polished.  
*Avanturine. Schmeißer mineral. 1. p. 114. Kirwan 1. p. 345.*  
Found near *Garpenburg* in *Sweden*, and containing veins of copper or iron, in the mountains of *Silesia*, *Saxony*, and *Switzerland*, likewise detached in *Spain*.
- bicolor.* Consisting of quartz, mica, and fluor. *Hoepfn. magaz. Helv. natur. 1. p. 281.*  
Found in the mountains of *Switzerland*.
- corneus.* Consisting of quartz, mica, and hornblend. *Hoepfn. magaz. Helv. natur. 1. p. 281.*  
Found in the mountains of *Switzerland*.
- triplex.* Consisting of quartz, mica, and garnets. *Hoepfn. magaz. Helv. natur. 1. p. 281.*  
Found in the mountains of *Switzerland*.
- glacialis.* Consisting of quartz, mica, and amarus. *Hoepfn. magaz. Helv. natur. p. 281, 282.*  
Found in the loftiest mountains of *Switzerland*.
- inconspicuus.* Composed of quartz and hornblend. *Hoepfn. magaz. Helv. natur. 1. p. 279.*  
Found in the mountains of *Switzerland*, and even near *Altenberg* in *Saxony*.

- helveticus.* Composed of quartz, hornblend, and garnets.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
 Found in the mountains of *Switzerland*.
- variegatus.* Composed of quartz, hornblend, and amarus.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
 Found in the mountains of *Switzerland*.
- capillaris.* Composed of pellucid quartz, and spicules of granadille.  
*Haarsteen. Herm. chem. annal.* 1788 2. p. 416.  
 Found detached in the *Ural* valleys of *Siberia*: admits a very high polish: the spikelets are yellowish or reddish, sometimes dull red immersed in transparent colourless quartz.
- acicularis.* Composed of pellucid quartz, and spicules of actinote.  
 Found detached at the base of the *Subaudic* mountains near *Geneva*.
- melaleucos.* Composed of quartz and shorl.  
*Saxum ex quartzo. Wall. jyst.* 1. p. 406. n. 1.  
*Hoefn. magaz. Helv. natur.* 1. p. 279.  
 In the mountains of *Switzerland* and *Sweden*.
- Hoefnieri.* Consisting of quartz, hornblend, and shorl.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
 Found in the mountains of *Switzerland*.
- efflorescens.* Consisting of quartz, shorl, and amarus.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
 Found in the mountains of *Switzerland*, and frequently contains efflorescent sulphate of magnesia.
- tirolensis.* Consisting of quartz, shorl, and garnets.  
*Hoefn. magaz. Helv. natur.* 1. p. 281.  
*Anonym. chem. annal.* 1785. 2. p. 22.  
 Found in the *Saviss* and *Tyrolese* mountains near *Zillertal*.
- bavaricus.* Consisting of quartz and garnets.  
*Hoefn. magaz. Helv. natur.* 1. p. 179.  
*Anonym. chem. annal.* 1785. 2. p. 22.  
 Found in the mountains of *Switzerland*, *Sweden*, *Saxony*, *Austria*, *Hungary*, *Tyrol*, and *Bavaria*, and the valleys which border upon them: the garnets are red, and the quartz grey or greenish, rarely grass-green.
- durissimus.* Consisting of quartz, granites, and amarus.  
*Hoefn. magaz. Helv. natur.* 1. p. 181.  
 Found in the mountains of *Switzerland*.
- talcifer.* Consisting of the greater part quartz, and talc.  
*Storr Alpenries.* 2. p. 278, 279.  
 Found in the *Aips* near *Clavennam* and *Marmels*, sometimes rendered yellowish by a mixture of iron ochre.

- splendidus*. Consisting of quartz, and small particles of mica and iron pyrites interspersed.  
*Bloch et Bruckmann. schr. berl. naturf. 1.*  
 Found detached in the *Ukraine* mountains, and is very splendid when polished.
- homogeneous*. Consisting of mica, hornblend, and shorl.  
*Hoeßn. magaz. Helv. natur. 1. tab. 3.*  
 Found in the mountains of *Switzerland*.
- nitidulus*. Consisting of mica, and hornblend.  
*Gioeni litolog. Vesuv. p. 53, 54.*  
 Found in the neighbourhood of *Vesuvius*, and has often garnets immersed in it.
- zillensis*. Composed of mica and shorl.  
*Hoeßn. magaz. Helv. natur. 1. p. 279, 280.*  
*Anonym. chem. annal. 1785. 2. p. 23.*  
 Found in the mountains of *Switzerland*, and in the valley *Zillerthal* between *Tyrol* and *Salzburg*: the crystals of shorl are sometimes larger sometimes smaller, and not unfrequently electric. \*
- granatifer*. Composed of mica and garnets.  
*Gioeni litolog. Vesuv. p. 53.*  
*Hoeßn. magaz. Helv. natur. 1. p. 279*  
 Found in the mountains of *Switzerland*, *Carinthia*, *Hungary*, *Saxony*, *Sweden*, and *Italy*.
- montanus*. Composed of mica, shorl, and garnets.  
*Hoeßn. magaz. Helv. natur. 1. tab. 3.*  
 Found in the mountains of *Switzerland*.
- viridescens*. Composed of mica, shorl, and amarus.  
*Hoeßn. magaz. Helv. natur. 1. tab. 3.*  
 Found in the mountains of *Switzerland*.
- radiatus*. Composed of mica, and actinote.  
*Hoeßn. magaz. Helv. natur. 1. p. 281.*  
 Found in the mountains of *Switzerland*, particularly *St Gothards*.
- olivinus*. Composed of mica, and olivine.  
*Gioeni litolog. Vesuv. p. 54, 55.*  
 Found in the neighbourhood of *Vesuvius*.
- chlorostictus*. Composed of shorl, and olivine.  
*Gioeni litolog. Vesuv. p. 65, 66.*  
 Found in the neighbourhood of *Vesuvius*.
- gemmaceus*. Composed of garnets, and olivine.  
*Gioeni litolog. Vesuv. p. 68.*  
 Found in the neighbourhood of *Vesuvius*.

- similaris.* Consisting of garnets, and shorl.  
*Gioeni litolog. Vesuv. p. 63. 68.*  
*Hoefn. magaz. Helv. natur. 1. tab. 2.*  
 Found in the mountains of Switzerland, and detached round *Vesuvius*, with sometimes a mixture of mica.
- affinis.* Consisting of granatine and genuine shorl.  
*Gioeni litolog. Vesuv. p. 70.*  
 Found in the neighbourhood of *Vesuvius*.
- montium.* Consisting of garnets, shorl, and hornblend.  
*Hoefn. magaz. Helv. natur. 1. tab. 3.*  
 Found in the mountains of Switzerland.
- bracteatus.* Consisting of garnets, and hornblend.  
*Hoefn. magaz. Helv. natur. 1. p. 279.*  
 Found in the mountains of Switzerland.
- argentatus.* Consisting of garnets, mica, and spar.  
*Gioeni litolog. Vesuv. p. 49.*  
 Found in the neighbourhood of *Vesuvius*.
- lamellatus.* Consisting of mica, and spar.\*  
*Gioeni litolog. Vesuv. p. 48.*  
 Found in the neighbourhood of *Vesuvius*.
- lucidus.* Consisting of actinote, and spar.  
*Gioeni litolog. Vesuv. p. 60.*  
 Found in the neighbourhood of *Vesuvius*, and may probably be an amygdalite.
- asbestinus.* Consisting of asbestos, and marble.  
*Gioeni litolog. Vesuv. p. 48.*  
 Found round *Vesuvius*, and is hardly of this genus.

60. GNEISSUM. Composed of parts cohering together without any intermediate cement, often in the form of crystals, and sometimes alternating in layers, of a slaty or rarely a fibrous texture forming plates laid on each other: found in lofty primitive mountains, generally resting upon beds of granite: hard, not melting before the blowpipe nor mouldering in the air.

- fernachm.* Consisting of the greater part quartz; and mica.  
*Sax. arenoso micac. Sys. nat. xii. 3. p. 79. n. 33.*  
*Saxum quartz. Wall. syst. 1. p. 410. n. 5.*  
*Gneiss. Kirwan mineral. 1. p. 346.*  
 Micaceous slate. *Schmeisser miner. 1. p. 310.*



Found in most mountainous countries of *Europe*, in innumerable varieties of proportion, combination, distribution, colour, and hardness, and is chiefly covered with argillaceous slate, sand, and limestone: it is formed of distinct plates laid on each other, and separated by thin layers of mica, and is generally rich in metallic ores: it is used for laying the beds of large melting furnaces.

*micaceum.* Consisting of the greater part mica, and quartz.

Glimmerschiefer. *Werner Classif. p. 10. sect. 9.*

Shistose mica. *Kirwan. miner. 1. p. 348.*

Micaceous shistus. *Thomson chem. 4. p. 131.*

Found in *Norway*, forming entire mountains, of a silvery colour and splendour: the plates of mica are extremely thin and closely compacted together, so as to form distinct tables; the quartz is generally disposed in small veins, granulations, or larger strata.

*alpinum.* Consisting of quartz, mica, and garnets.

Saxum micaceum. *Syst. nat. xii. 3. p. 77. n. 22.*

Saxum quartzo. *Wall. syst. 1. p. 412. n. 7.*

Found in most lofty alpine mountains of *Europe*: the mica is mostly silvery, sometimes predominant, sometimes pretty equally distributed, sometimes hardly visible: the garnets are more commonly red than brown, sometimes of a common form and of considerable size, sometimes crystallized and less: the plates of which it is composed are frequently undulate: sometimes there is found with it a portion of shorl, talc, or feldspar: when the quartz is in greater proportion it is made into mill-stones.

*scorlinum.* Consisting of quartz, mica, and shorl.

Found in the mountains of *Switzerland*, especially *St. Gotthard's*, in those of *Hungary* near *Schemnitz*, and containing veins of gold or silver, and in those of *Bohemia*, *Saxony*, and *Norway*.

*altenbergense.* Consisting of quartz, mica, and shorlite.

Found near *Altenberg* in *Saxony*, having veins of tin within it.

*radians.* Consisting of quartz, mica, and actinote.

*Cronst. mineral. sect. 261. 33.*

Saxum quartzo, &c. *Wall. syst. 1. p. 413. n. 8.*

Found in *Jemtia* in *Sweden*.

*Saxonum.* Consisting of quartz, mica, and feldspar.

Gneiss. *Werner Classif. p. 8. sect. 8.*

Found in the mountains of *Saxony*, *Bohemia*, *Switzerland*, and *Silesia*, rarely in the *Carpathic* mountains, in great varieties of proportion, colour and constituent parts: the mica is generally preeminent, and the feldspar the least.

- Bornii.* Consisting of quartz, mica, and alumina.  
 Gneissum. *Born. ind. foss.* 1. p. 153. 2. p. 147.  
 2. Saxum coticulare. *Syst. nat.* xii. 3. p. 74. n. 12.  
 Argillaceous schistus. *Schmeißer mineral.* 1. p. 312.  
 Argillaceous schistus. *Thomson chem.* 4. p. 132.  
 Found in the metallic mountains of *Hungary, Bohemia, Saxony,*  
 and *Sweden*: the variety 2) is often used as a whetstone to  
 sharpen scythes and large instruments.
- Femticum.* Consisting of quartz, mica, and steatite.  
*Edelf. nov. Act. Stokb.* 1784. p. 93.  
 Found in the higher mountains of *Femtia*, and differs a little  
 from others of its genus in gradually mouldering away when  
 exposed to the atmosphere.
- spatozum.* Consisting of quartz, shorl, and feldspar.  
*Anon. chem. annal.* 1785. 2. p. 23.  
 Found near *Halbendorf* in *Saxony*.
- topasinum.* Consisting of quartz, shorl, and topaz.  
 Topas fels. *Werner Classif.* p. 15. sect. 18.  
 Found at *Schneckenstein* near *Auerbach* in *Voigtland*.
- comeum.* Consisting of quartz, and hornblend.  
 Talcum lamellare. *Syst. nat.* xii. 3. p. 53. n. 8.  
 Corneus rigidus. *Wall. syst.* 1. p. 358. n. 2.  
 Hornblend schistus. *Schmeißer mineral.* 1. p. 311.  
 Schistose hornblend. *Kirwan mineral.* 1. p. 222.  
 Hornblende slate. *Jameison mineral.* 1. p. 363.  
 Found at *Portsey* in *Scotland*; *Saxony, Norway,* and *Sweden*:  
 colour between greenish and raven black, and gives a green-  
 ish-grey streak: texture radiate, and breaking into indeter-  
 minate fragments: is hardish, and frequently found mixed  
 with small particles of mica or garnets.
- argillosum.* Consisting of quartz, and alumina.  
*V. Fichtel Karpath.* p. 275.  
 Found in the *Carpathic* mountains.
- cotianum.* Consisting of alumina, and mica.  
 Saxum schistosum. *Syst. nat.* xii. 3. p. 79. n. 34.  
 Saxum, schisto, &c. *Wall. syst.* 1. p. 417. n. 11.  
 Found in *Norway* and *Sweden*, hardish, melting in the fire,  
 and is used by the inhabitants to polish steel instruments:  
 probably not of this genus.
- steatiticum.* Consisting of steatite, and mica.  
 Schneiderstein. *Cronst. miner. sect.* 263. 5.  
 Found in the mountains of *Norway, Sweden, Hungary, &c.*  
 soft, and is used for the walls of melting furnaces, and when  
 separated into thin plates, for the covering of houses: proba-  
 bly not of this genus.

- graniticum*. Consisting of common shorl, garnets, and feldspar.  
*Gioeni litolog. Vesuv. p. 64.*  
 Found in the neighbourhood of *Vesuvius*.
- bicolor*. Consisting of shorl, and feldspar.  
*Gioeni litolog. Vesuv. p. 72.*  
 Found in the neighbourhood of *Vesuvius*.
- olivinum*. Composed of mica, garnets, and olivin.  
*Gioeni litolog. Vesuv. p. 54.*  
 Found in the neighbourhood of *Vesuvius*.
- lucidum*. Composed of mica, and hornblend.  
*V. Fichtel Karpath p. 276. 279.*  
 Found in *Sweden*, and the *Carpathic* mountains.
- triplex*. Composed of mica, hornblend, and quartz.  
*V. Fichtel Karpath. p. 276. 279.*  
 Found in the *Carpathic* mountains.
- syeniticum*. Composed of hornblend, feldspar, and quartz.  
*V. Fichtel Karpath. p. 279.*  
 Found in the *Carpathic* mountains.
- squamosum*. Composed of hornblend, and feldspar.  
*Fichtel Karpath. p. 279.*  
 Found in the *Carpathic* mountains.
- granatinum*. Composed of hornblend, and garnets.  
*Fichtel Karpath. p. 246. 280. 287.*  
 Found in the *Carpathic* mountains.
- splendidum*. Composed of hornblend, mica, and garnets.  
*Fichtel Karpath p. 246. 287.*  
 Found in the *Carpathic* mountains.
- quadruplex*. Composed of hornblend, mica, garnets, and quartz.  
*Fichtel Karpath. p. 246. 287.*  
 Found in the *Carpathic* mountains.
- lamellosum*. Composed of hornblend, and shorl.  
*Fichtel Karpath. p. 280.*  
 Found in the *Carpathic* mountains.
- basalticum*. Composed of mica, and electrical shorl.  
*Anon. chem. annal. 1785. 2. p. 23.*  
 Found in the *Salisburg* and *Tyrolese* valleys.
- glandulosum*. Composed of mica, and garnets.  
*Fichtel Karpath. p. 246. 287.*  
 Found in the *Carpathic* mountains.

*durum.* Composed of mica, garnets, and quartz.

*Fichtel Karpath. p. 246. 287.*

Found in the *Carpathic* mountains.

*quartzosum.* Composed of garnets, and quartz.

*Fichtel Karpath. p. 246. 287.*

Found in the *Carpathic* mountains.

*micans.* Composed of shining marble, and mica.

1. Golden mica scattered among the marble.

*Avanturino. Broch. miner. sicil.*

2. Green mica disposed in strata.

*Marmo Cipolino. Freber. Br. a. Welschbl. p. 251.*

Found detached in *Sicily*, in a cave on mount *Caputo*, the second variety in *Greece*: probably not of this genus.

61. PORPHYRIUS. Consisting of distinct crystals of another genus imbedded in a compact hardened paste: massive, varying extremely in age, duration, hardness, and colour.

#### A. *Talcofe.*

*talcosus.* Consisting of talc, and crystals of quartz imbedded.

*Storr Alpenr. 2. p. 280.*

Found in the valley *Tellina* near *Clavennam*, of a silvery colour.

*ponderosus.* Consisting of talc, and common barytes.

*Storr Alpenr. 2. p. 266.*

Found in the valley *Tellina* near *Cassion*, of a dull greenish colour.

*rheticus.* Consisting of talc, barytes, and spar.

*Storr Alpenr. 2. p. 209.*

Found on mount *Despin* in the country of the *Grisons*, of a sea-green or white colour.

#### B. *With a serpentine base.*

*arenarius.* Composed of serpentine, and lesser crystals of quartz imbedded.

*Saxum serpentinum. Herrm. Ural. Erz. 2. p. 321.*

*Freber. Br. a. Welschland. 23. p. 363.*

Found in the eastern part of the *Ural* mountains of *Siberia*, the interior mountains of *Austria*, and other parts of the continent: hard, forming rocks and the greater parts of mountains, and is sometimes enriched with small particles of mica.

*acicularis*. Consisting of serpentine, and small spicules of shorl imbedded.

Ophiter. *Born. ind. foss.* 1. p. 148?

Saussur. *it. alp.* 1. p. 105.

2. With the crystals of shorl decussating each other.

Found near *Sasska* in the *Temesian* mountains, near *Schemnitz* in the *Hungarian* ones, and detached near *Geneva*: of an olive, blueish, or grey colour.

*granatinus*. Consisting of serpentine, and garnets.

Charpent. *geogr. churf.* p. 179.

Found near *Zoebliz* in *Saxony*.

*spurius*. Composed of serpentine, spar, and mica.

Freber. *Br. auf. Welschl.* 19. p. 334.

Found in the mountains of *Tuscany*, forming horizontal strata; green, the spar white, the mica silvery-greenish and tessular.

*Granitone*. Composed of serpentine, and feldspar.

Freber. *Br. auf. Welschl.* 19. p. 334.

Found in the mountains of *Tuscany*; green with imbedded prisms of white feldspar, with sometimes a little silvery-green mica: is frequently cut into mill and grindstones.

*micaceus*. Composed of serpentine and foliations of mica.

Charpent. *geogr. churf.* p. 178.

Freber. *Br. auf. Welschl.* 19. p. 332.

Saussur. *it. alp.* 1. p. 135.

2. Filled with nidules of variable gold mica in parallel and straight foliations.

Trebra. *Ersarb. v. inn. d. Geb.* p. 97.

Schræt. *n. Litterat. d. natur.* 4. p. 232.

Herrmann. *Ural. Erzg.* 2. p. 323.

Found near *Impruneta* and *Prato* in the mountains of *Tuscany*, near *Bocchatia* and the valley bounding *Polzevera* in the *Genoa* mountains, and near *Zoebliz* in *Saxony*; the second variety in the *Hercynian* and *Siberian* mountains.

*asbestinus*. Composed of serpentine, and fibres of asbestos with a silky lustre.

Freber. *Br. auf. Welschl.* 19. p. 332.

Charpent. *geogr. Churf.* p. 178.

Found in the mountains of *Saxony*, *Franconia*, *Hercynia*, and *Tuscany*.

*ferrifer*. Composed of serpentine, and crystals of iron.

Saussur. *it. alp.* 1. p. 79.

Charpent. *geogr. Churf.* p. 179.

*Freber Br. auf. Welschl. 23. p. 377.*

Found in the mountains of *Saxony* near *Zoebliz*, and *Piedmont* near *Fenestrella*, detached near *Geneva*.

*C. With a base of Amarus.*

*helveticus.* Consisting of amarus, and hornblend.

*Hoepfn. mag. helv. natur. 1. p. 279.*

Found in the *Swiss* mountains, green.

*alpinus.* Consisting of amarus, and feldspar.

*Hoepfn. mag. helv. natur. 1. p. 279.*

Found in the alps of *Switzerland*.

*micans.* Consisting of amarus, and mica.

*Hoepfn. mag. helv. natur. 1. p. 279.*

Found in the mountains of *Switzerland*.

*bicolor.* Consisting of amarus, and garnets.

*Hoepfn. mag. helv. natur. 1. p. 279.*

Found in the mountains of *Switzerland*.

*spiculatus.* Consisting of amarus, and shorl.

*Hoepfn. mag. helv. natur. 1. tab. 2.*

Found in the mountains of *Switzerland*.

*D. With a calcareous base.*

*calcareus.* Composed of limestone, and crystals of quartz imbedded.

Found in the conflux of the circles of *Germany*, of a flaty texture.

*Macigno.* Composed of indurated marl, and the greater part mica.

*Freber Br. a. Welschl. 7. p. 96. 19. p. 324.*

Found near *Fiesch* in *Tuscany*: colour grey, sometimes verging to yellowish or blueish, the latter of which grows black and moulders in the air: it is disposed in horizontal strata, the lower of which are harder.

*austriacus.* Composed of indurated marl, and shorl.

*Born. ind. fosi. 1. p. 34.*

Found near *Trawnsstein* in *Austria*.

*E. With an argillaceous base.*

*granitoides.* Consisting of alumina, and the greater part feldspar.

*Granit. porphyr. Nose orogr. p. 106. 110. 111.*

Found on the banks of the lower *Rhine*, and near *Altenburg* in *Saxony*: it easily moulders in the air, and has sometimes a small portion of quartz or mica.

- granaticus.** Composed of alumina, feldspar, garnets, and a very small portion of quartz.  
*Karsten Leske mineral.* 2. p. 24.  
 Found near *Wittelsburg* in the province of *Hesse*.
- gotiarius.** Composed of alumina, and crystals of quartz.  
*Zechstein. Carpent. geogr. Churf.* p. 149.  
*Cottentz in. Latus harggeb.* 1. p. 255. 2. n. 78.  
*Mergelstein. Schult. hamb. mag.* t. 33.  
*Clay Porphyry. Thomson chem.* 4. p. 133.  
 Found on the banks of the *Rhine*, in *Saxony* and other places: it has sometimes a few particles of feldspar mixed with it, which mouldering away, leaves it full of hollows.
- metallifer.** Composed of alumina, quartz and other crystals.  
*Saxum metalliferum. Born. ind. foss.* 1. p. 154. 155.  
 Found in the *Tyrolese* mountains, those of *Hungary*, *Bohemia*, and *Transylvania*, and is rich in metallic veins: colour white, whitish, grey, or blueish: in its composition is always alumina and quartz, and sometimes feldspar, ætinote, hornblende, mica, or lithomarg.
- transylvanicus.** Composed of alumina, and crystals of mica.  
*Karsten Leske mineral.* 2. p. 24.  
 Found near *Felsobanga* in *Transylvania*.
- Delphinatus** Composed of alumina, shorl, and asbestos.  
*Hoffmann Berg. Journ.* 1788. 1. p. 57.  
 Found near *Bourg d' Oisseau* in *Dauphigny*; the alumina impregnated with oxide of iron; the shorl of two kinds, one glassy, the other contaminated with ochre of iron: semitransparent, hard, compact, grey, a little shining internally, breaking into fragments with acute angles, in the form of very thin 4-sided tables cylindrically excavated at the sides and again aggregate into tables.
- spadiceus.** Composed of alumina, and garnets.  
*Hoffmann Berg. Journ.* 1788. 1. p. 246.  
 Found near *Schneeberg* in *Saxony*, where it forms a vast stratum under the soil, and is added to the flux of mineral furnaces: the alumina is rich in oxide of iron, and the garnets are brownish red.
- chlorogranaticus.** Composed of alumina, and chlorogranates.  
 Found near *Ibenstock* in *Saxony*.
- F. *With a basaltic base.*
- antiquus.** Consisting of trap, and feldspar.  
*Cronst. mineral. scd.* 265.  
*Porfido verde. Freber Br. Welfschl.* 16. p. 265.

Trap Porphyry. *Kirwan miner.* 1. p. 355.

Found — : the trap green, the crystals of felspar white and varied with black crystals of shorl.

- sinnitans.* Consisting of trap, and spicules of shorl.  
Saxum corneo. *Wall. Syst. min.* 1. p. 410. n. 12.  
Found in *Swed: fsh Westrogoth*; when placed on the point of the finger and struck with a hard body, it makes a ringing noise.
- Angliæ.* Composed of trap, and crystals of quartz.  
Rowley rag. *With. Phil Transf.* 70. p. 2. n. 201  
Turillite. *Kirwan miner.* 1. p. 229.  
Found in various parts of *England*, and has been before described in p. 127 of this work, as a variety of Trap.
- acerosus.* Consisting of trap, and minute crystals of hornblend imbedded.  
Corneus trapezius. *Wall. Syst.* 1. p. 362. n. 4. f.  
Found in the mountains of *Hunueburg*, *Kinnekkulle*, and *Stolberg* in *Sweden*; dull grey or blackish.
- squamosus.* Consisting of trap, and mica.  
Corneus trapezius. *Waller Syst.* 1. p. 363. n. 4. g.  
Found in the mountains of *Sweden*.
- lamellosus.* Consisting of wacke, and hornblend.  
*Karst. mag. helv. natur.* 3. p. 234.  
Wacken Porphyry. *Kirwan mineral.* 1. p. 355.  
Found in *Saxony*, yellowish, greyish, or liver-brown.
- spatosus.* Consisting of wacke, and calcareous spar.  
*Karst. mag. helv. natur.* 3. p. 234.  
Found in *Saxony* and *Bohemia*, and even at *Frankfort* on the *Maine*.
- nigerrimus.* Consisting of black wacke, and black crystals of mica.  
*Widenman mag. helv. natur.* 4. p. 196, 197.  
*Werner Bergm. Journ.* 1728. 2. p. 853.  
Found in the mountain *Schneeberg* and others in *Saxony*, and near *Joachimthal* in *Bohemia*.
- ægyptius.* Consisting of basalt, and hornblend.  
*Werner Bergm. Journ.* 1788. 2. p. 853.
1. The crystals of hornblend deep black, very small, and very firmly imbedded.
  2. With larger and greenish spots of hornblend.  
Pietra nefritica. *Freber Br. Welschl.* 16. p. 274.  
Found in *Egypt*.



- basalticus.* Consisting of basalt, and felspar, with sometimes a few particles of quartz and mica interspersed.  
*Freber Br. auf. Welschl.* 16. p. 274.  
 Found —, and is sometimes found among the ancient monuments of *Rome*.
- Pedicularis.* Consisting of basalt, and crystals of granatine shorl.  
*Freber Br. auf. Welschl.* 16 p. 272. 274.  
 Found here and there among the ancient monuments of *Rome*, with frequently a small mixture of hornblend or shorl: the crystals of shorl are sometimes so small as hardly to exceed in magnitude the point of a needle.
- fuldensis.* Consisting of basalt, and garnets.  
 Found in the mountain *Pferdekopf* in the bishopric of *Fulda*.
- olivinus.* Consisting of basalt, and olivine.  
*Gioeni litolog. Vesuv.* p. 90.  
 Found round *Vesuvius*, and sometimes contains a few garnets.

G. *With the base of lava.*

- vulcanicus.* Composed of lava, and hornblend.  
*Freber Br. a. Welschl.* 11. p. 178.  
 Found in most volcanic mountains.
- ocellatus.* Composed of lava, and crystals of granatine shorl.  
*Gioeni litolog. Vesuv.* p. 97--100. 102, 103. 109. 123.  
*Freber Br. a. Welschl.* 11. p. 176, 178, 179.  
 Found round *Vesuvius*, black, grey, or red: sometimes containing genuine shorl, or mica, rarely felspar or garnets.
- bacillaris.* Composed of lava, and 6-sided prisms of genuine shorl.  
*Gioeni litolog. Vesuv.* p. 92--100.  
*Freber Br. a. Welschl.* 11. p. 167. 177--179.  
 Found near *Vesuvius* and in the *Marchesas* islands; black, grey, or red: the crystals of shorl are sometimes very obtuse-angled, thinner or thicker, black, white, blue or green of various shades, sometimes mixed with crystals of actinote, garnet, or granatine shorl.
- nitidulus.* Composed of lava, and mica.  
*Gioeni litolog. Vesuv.* p. 89. 102. 118.  
 Found in volcanic mountains, and frequently containing crystals of granatine or genuine shorl, or garnets, or both.
- decipiens.* Composed of lava, and felspar.  
*Gioeni litolog. Vesuv.* p. 123.  
*Dolomieu mem. et ca. al.* p. 8.  
 Found in *Sicily* and round *Vesuvius*, generally including some hornblend, rarely mica or shorl.

H. *With a base of pitch.**piceus.*

Composed of pitch, feldspar, and quartz.

*Hoffmanu Berg. Journ.* 1788. 2. p. 491.Pitchstone Porphyry. *Thomson.* 4. p. 133. *Kirwan.* 1. p. 351.Found near *Misena* in *Saxony*, forming entire mountains alternating with mountains of porphyry and clay, in horizontal strata: colour black, green, brown, or red.I. *With a base of chert or hornstone.**schistosus.*

Consisting of hornstone and feldspar, of a flaty texture.

Hornschiefer. *Charpent. geogr. churf.* p. 21. 24, 25. 28.Porphyrschiefer. *Werner classif.* p. 11. sect. 11.Hornporphyr. *Nose orogr.* 1. p. 7.Horn porphyry. *Kirwan mineral.* 1. p. 352.Found common in *Bohemia*, *Lusace*, and in the bishopric of *Fulda*, rarely containing ores of metal: colour generally grey, rarely black, and often marked with arboresecent ramifications: in *Italy* it approaches to a basalt, and melts in the fire to a yellowish glass, but not so easily as basalt: the chert and feldspar are mixed in various proportions, to which is sometimes added hornblend, rarely mica, garnets or spar, very rarely veins of marble.*villosus.*

Consisting of hornstone and feldspar, of a splintery texture.

*Karsten Leske mineral.* 2. p. 25.Hornstone porphyry. *Thomson. chem.* 4. p. 133. *Kirwan* 1. 351.

1. Of a texture approaching to conchoidal.

Hornsteinporphyr. *Nose orogr.* 1. p. 16.

2. The feldspar very intimately and finely intermixed.

Hornquartz porphyr. *Nose orogr.* 1. p. 16.Hornartiger Trapp. *Lafius Beob. Harz.* p. 17. 112, &c.

3. With particles of jasper added to the chert and feldspar.

Hornartiger Porphyr. *Nose orogr.* 1. p. 16.

4. With quartz added to the chert and feldspar.

*Karsten Leske mineral.* 2. p. 27.

5. With hornblend added to the chert and feldspar.

*Karsten Leske mineral.* 2. p. 27.Found in various proportions of constituent parts and colours, in the mountains of lower *Italy*, *Hungary*, *Bohemia*, *Lusace*, *Saxony*, *Carinthia*, the boundaries of the lower *Rhine* and *Denmark*, frequently exhibiting particles of hornblend, mica and shorl.

- durissimus.* Consisting of hornstone, and quartz.  
*Karsten Leske mineral.* 1. p. 110.  
 Found in the *Tyrolese* mountains.
- tricolor.* Consisting of hornstone, quartz, and garnets.  
*Karsten Leske mineral.* 2. p. 27.  
 Found in *Hungary*.
- corneus.* Consisting of hornstone, quartz, and hornblend.  
*Karsten Leske mineral.* 2. p. 27.  
 Found in *Bohemia* and *Saxony*.
- rechlizensis.* Consisting of hornstone, quartz, and mica.  
*Karsten Leske mineral.* 1. p. 109.  
 Found in *Saxony*, of a perlaceous reddish colour.
- inequalis.* Consisting of hornstone, and mica.  
*Hoepfn. mag. helv. natur.* 1. p. 278.  
 Found in the mountains of *Switzerland*.
- scorlaceus.* Consisting of hornstone, and shorl.  
*Hoepfn. mag. helv. natur.* 1. p. 278.  
*Storr Alpenr.* 2. p. 231. 265.  
 Found in the mountains of *Switzerland*, and those in the country of the *Grisons*.
- baryticus.* Consisting of hornstone, and barytes.  
*Storr Alpenr.* 2. p. 231.  
 Found in the mountain *Muschelborn*, in the country of the *Grisons* on the alps.
- specaceus.* Consisting of hornstone, and spar.  
*Hoepfn. mag. helv. natur.* 1. p. 278.  
*Storr Alpenr.* 2. p. 266.  
 Found in the mountains of *Switzerland*.
- radians.* Consisting of hornstone, and actinote.  
*Karsten Leske mineral.* 1. p. 109.  
 Found near *Sahlberg* in *Sweden*.

K. *With a base of jasper:*

- genuinus.* Composed of jasper, and feldspar.  
*Saxum porphyrius.* *Syst. nat.* xii. 3. p. 72. n. 1.  
*Saxum jaspide, &c.* *Wall. syst. min.* 1. p. 414. n. 9.  
*Saxum comp. jaspide.* *Cronst. miner.* 264. 6.  
*Porphyry.* *Schmeisser min.* 1. p. 312. *Thomson.* 4. p. 132.  
*Jasper Porphyry.* *Kirwan mineral.* 1. p. 350.

Found in *Egypt, Arabia, Greece, Italy, South of France, Siberia*, and most parts of *Europe*, sometimes detached, sometimes forming rocks, mountains, or their principal parts, opaque, of a texture more commonly approaching to the conchoidal than the slaty, hard and admitting a fine polish, breaking into indeterminate fragments, easily melting in the fire; generally of a common form, rarely in prisms and then always mixed with other bodies, as hornblend, mica, shorl, or quartz; infinitely varying in the colour, form, distribution, and mixture of its constituent parts; the feldspar generally white or reddish, immersed in jasper in the form of dots, spots, stripes, or prisms, and sometimes mouldering away and leaving cavities; the jasper red, brown, black, or green, rarely dull grey or of two colours, as black and green, red and orange. It was used by the ancients in the structure of columns, temples, and edifices of the highest orders.

*corsicanus.* Composed of jasper? and actinote.

Marmor verd. di Cors. *Freber Br. a. Welsch.* 21. p. 357.

Found in *Corfica*, white with violet spots and rays of green actinote.

*amiantinus.* Composed of jasper, asbest, and quartz.

Found detached in the province of *Mansfeld*; the jasper red, the asbest greenish, and the quartz white.

*nitens.* Composed of jasper, and mica.

*Hoefn. mag. helv. natur.* 1. p. 278.

Found in *Switzerland*, and near *Annaberg* in *Saxony*.

*scorlinus.* Composed of jasper, and shorl.

*Hoefn. magaz. helv. natur.* 1. p. 278.

Found in *Switzerland*.

*effervescens.* Composed of jasper, and spar.

*Hoefn. mag. helv. natur.* 1. p. 278.

Found in *Switzerland*.

*granatifer.* Composed of jasper, and garnets.

*Hoefn. mag. helv. natur.* 1. p. 278.

Found in *Switzerland*.

*crystallinus.* Composed of jasper, and crystals of quartz.

*Hoefn. mag. helv. natur.* 1. p. 278.

Found in *Switzerland*.

*Achates.* Composed of jasper, quartz, rock crystal, amethyst, chalcidony, cornelian, and onyx, hornstone, and flint, variously combined together.

*Silex rupestris.* *Syst. nat.* xii. 3. p. 70. n. 10.

*Achates durissima.* *Wall. syst.* 1. p. 284. n. 22.

Achates. *Rumph. mus. tab 56. f. A—D.*

Agate. *Schmeißer mineral. 1. p. 117.*

1. The constituent parts disposed in alternate straight, rarely undulate, bands differing in colour.

Bandachat. *Karsten Leske miner. 1. p. 139.*

Striped Jasper. *Kiravan miner. 1. p. 312.*

Jasper Agate. *Jameison miner. 1. p. 242.*

2. Composed of fragments angularly crustose.

Veitungsachat. *Karsten Leske miner. 1. p. 140.*

3. With figures resembling landscapes.

Landschaftsachat. *Karsten Leske miner. 1. p. 145.*

4. In painted annulations of different colours.

Ringachat. *Karsten Leske miner. 1. p. 143.*

5. With figures resembling moss.

Moosachat. *Karsten Leske miner. 1. p. 145.*

6. With figures resembling stellar dots.

Sternachat. *Karsten Leske miner. 1. p. 146.*

Found in infinite varieties of proportion and distribution of parts, tinge of colours, hardness and lustre, in *Britain, Ceylon*, and most parts of *Europe*, sometimes detached, sometimes imbedded in clay, rarely in veins or a stalactitical form, and is used for rings, ornaments, and the decoration of nobler edifices.

62. AMYGDALITES. Consisting of various rounded or elliptical stones of different sizes, imbedded together, and forming an irregular mass: occurring principally in mountains of a later date, and generally mouldering when exposed to the air.

*Almond-stone.*

A. *With a talcose base.*

*rheticus.* Consisting of steatite, and hornstone.

*Storr Alpen. 2. p. 214.*

Found in *Dejpiner Alp* in the country of the *Grisons*, pale green, the hornstone grey.

*fornacum.* Composed of steatite, and barytes.

*Gulstein. Storr Alpen. 2. p. 51, 52.*

Found in the valley *Urjexen*, where the inhabitants, after cutting it into thick plates, make kilns of it: colour greenish-grey, the barytes grey and rough with prominent glandules: it is not easily turned into vases, and becomes full of cracks in the fire, unless it be exposed to it in sufficiently large plates.

- glandulosus*. Composed of serpentine or marble, and spar.  
Found in *Italy*, and near *Schwarzenburg* in *Saxony*.
- homogeneous*. Composed of serpentine, and pot-stone.  
Found near *Zoelig* in *Saxony*.
- leucocoloros*. Composed of serpentine, and quartz.  
Found near *Sala* in *Sweden*, of a whitish-green colour.
- granaticus*. Composed of asbest, and garnet.  
*Born. ind. foss. 1. p. 32.*  
Found in the *Tyrolese* mountains and *Lapland*, with sometimes a small mixture of mica.

B. *With a calcareous base.*

- Ophites*. Consisting of marble, and serpentine.  
*Saxum compositum, &c. Cronst. mineral. sect. 209. 1. 1--3.*  
*Hornblende Porphyry. Kirwan miner. 1. p. 354?*  
Found in *Sweden*, *Italy*, and the south of *Africa*, generally white, the serpentine green or black.
- bestruricus*. Consisting of macigno and serpentine, with glandules of marble or alumina.  
*Freber Br. auf. Welschl. 19. p. 324.*  
Found in *Tuscany* near *Fiesoli*.

C. *With an argillaceous base.*

- primigenius*. Composed of alumina, and quartz.  
*Saxum lapillis. Syst. nat. xii. 3. p. 80. n. 37?*  
Found in *Sweden*.
- asbestinus*. Composed of alumina, asbest, and garnets.  
*Freber Beytr. Bohem. mineral. p. 51.*  
Found near *Orpes* in *Bohemia*, containing a vein of iron ore, with sometimes a little thorl, wolfram, mica, or hornblend.
- lamellosus*. Composed of alumina, hornblend, and spar.  
Found near *Schneeberg* in *Saxony*.
- cæmentarius*. Composed of tarras, and lavas.  
Found in various parts of *Italy*.
- Wacca*. Composed of wacke, and spar.  
*Karsten mag. Helv. natur. 3. p. 234, &c.*  
Found frequently in *Saxony*.
- sordidus*. Composed of wacke, and quartz.  
*Werner chem. annal. 1789. 1. p. 131.*  
Found near *Joachimthal* in *Bohemia*.

- serpentinus*. Composed of trap, and serpentine.  
Found in the stratified mountains of *Italy* and *Silesia*: the trap most commonly brown, the serpentine dull green: the nodules very much resemble fruit, or elliptical or globular seeds.
- steatiticus*. Composed of trap, and steatite.  
Found in the dutchy of *Bipontium* and *Franconia*.
- vulgaris*. Composed of trap, and spar.  
Saxum glandulosum *Wail. syst.* 1. p. 214. n. 17. 2.  
Common Almond-stone. *Schmeißer miner.* 1. p. 320.  
Amygdaloid. *Kirwan mineral.* 1. p. 258.  
Found in *Derbyshire* and other parts of *Britain*, in *Italy*, *Saxony*, *Bohemia*, *Hungary*, &c. in stratified mountains, and is often the matrix of agate and chalcedony: the spar is always white, with sometimes a coating of green alumina: the glandules are larger or less, and more or less thickly dispersed through the mass which is red, brown, green, grey, or black: there is likewise often an admixture of mica, green alumina, or felspar.
- gypseus*. Composed of trap, and selenite.  
Found in the dutchy of *Bipontium*.
- variolosus*. Composed of trap, and lithomarg.  
*Karsten Leske mineral.* 2. p. 38.  
Found in *Bohemia* and *Saxony*, the lithomarg white.
- æruginosus*. Composed of trap, and green alumina.  
Found in the vast mountains near *Brammey* in *Bohemia*, near *Zwickau* in *Saxony*, and near *Ilefeld* in *Hercynia*; the trap moistly brown.
- zeolithicus*. Composed of trap, and globules of zeolite.  
Found in the dutchy of *Bipontium*.
- tuberosus*. Composed of trap, and glandules of quartz.  
Found near *Frankfort* on the *Maine*.
- chalcedoni-*  
*us*. Composed of trap, and chalcedony.  
Found near *Frankfort* on the *Maine*: the chalcedony is frequently in a botryoidal form, and sometimes pellucid like glass, or resembling opal.
- chlorostictus*. Composed of columnar basalt, and steatite.  
Found in basaltic strata on the lower *Rhine*, and near *Goettingen*: the glandules of steatite are greenish, sparingly scattered, and the basalt black.

- spatosus*. Composed of columnar basalt, and spar.  
Found in the basaltic mountains of *Hesse*.
- marmoreus*. Composed of columnar basalt, and glandules of marble.  
*Freber Br. Welschl. p. 280.*  
Found near *Radicefani* in *Italy*.
- argillosus*. Composed of columnar basalt, and glandules of alumina.  
Found in the basaltic mountains of the south of *France*.
- radians*. Composed of columnar basalt, and glandules of zeolite which are stellate in a radiate manner.  
Found in the basaltic mountains of the south of *France*, *Hesse*, and *Lusace*.
- piceus*. Composed of columnar basalt, and pitch.  
Found in the basaltic mountains in the neighbourhood of *Goettingen*.
- olivinus*. Composed of columnar basalt, and olivine.  
Found in the basaltic mountains of the south of *France*, *Hesse*, *Franconia*, *Saxony*, *Lusace*, and *Bohemia*.
- durus*. Composed of columnar basalt, and glandules of quartz.  
*Freber. Br. auf. Welschl. p. 274.*  
Found in *Italy*.
- granitoides*. Composed of columnar basalt, and glandules of granite.  
*Freber Br. auf. Welschl. p. 273.*  
Found in *Italy* and the south of *France*.
- ferrifer*. Composed of columnar basalt, and spatose iron stone.  
Found in the basaltic mountains in the neighbourhood of the *Maine*.
- brecciatius*. Composed of lava, and glandules of marble.  
*Freber: Br. a. Welschland. 14 p. 226. 18. p. 312.*  
Found in the volcanic mountains of *Italy*, and in detached pieces near the rivers.
- argillaceus*. Composed of lava, and glandules of alumina.  
Found in the southern and middle parts of *Italy*.
- schistiferus*. Composed of lava, and lumps of shist.  
Found in *Sicily*, and the neighbouring islands.
- albo-macn-latus*. Composed of lava, and glandules of zeolite.  
Found in *Sicily*.
- gemmifer*. Composed of lava, and olivine.  
*Freber Br. auf. Welschl. 11. p. 173.*  
Found frequently at the base of *Vesuvius*.



- pyromacus.* Composed of lava, and glandules of flint.  
Found at the base of *Vesuvius*.
- inconspicuous* Composed of lava, and glandules of garnets.  
Found in *Sicily*.
- achatoïdes.* Composed of lava, and chalcedony.  
Found in *Iceland*.
- ferruginosus* Composed of lava, and iron ore.  
Found in *Iceland*.

D. *With a filiceous base.*

- Margodes.* Consisting of hornstone, and glandules of marl.  
*Saussure Voyage dans les Alpes.* 1. p. 141.  
Found near *Geneva*, in detached pieces.
- similaris.* Consisting of hornstone, and glandules of clay.  
Found near *Pzibram* in *Bohemia*, and in the mines of *Saxony* and *Bipontium*.
- jemticus.* Consisting of hornstone, and glandules of zeolite.  
*Born. ind. foss.* 1. p. 47.  
Found near *Jemtia* in *Sweden*.
- quartzifer.* Consisting of hornstone, and glandules of quartz.  
*Charpent. geogr. Churf.* p. 286.  
Found near *Schneeberg* and *Johannegeorgenstadt* in *Saxony*.
- Cronstedtii.* Consisting of jasper, spar, and glandules of serpentine.  
*Saxum basi jaspidea.* *Cronst. mineral. sect.* 266.  
*Saxum glandulosum.* *Wall. jst.* 1. p. 244. n. 17. b.  
*Born. ind. foss.* 1. p. 151.  
Found near *Moj's* in *Norway*, and near *Zwickenau* in *Saxony*:  
red, with the glandules variegated white and green.
- albo-guttatus.* Consisting of jasper, and glandules of spar.  
*Born. ind. foss.* 1. p. 152.  
Found near *Stitz* in *Bohemia*, of a grey-green colour.
- albo-fuscus.* Consisting of jasper, and lithomarg.  
*Born. ind. foss.* 1. p. 146.  
Found near *Bukau* in *Bohemia*.
- cinereus.* Consisting of jasper, and zeolite.  
*Born. ind. foss.* 1. p. 151.  
Found in *India*.
- helveticus.* Consisting of jasper, and amarus.  
*Hoefsch. magaz. Helv. natur.* 1. p. 278.  
Found in the mountains of *Switzerland*.

- sibiricus.* Consisting of jasper, and quartz.  
*Saxum jaspideum.* *Syst. nat.* xii. 3. p. 78.  
 Found near the river *Ural* in *Siberia*, near *Brescia* in *Italy*,  
 near *Stuttgard* in *Wirtemberg*, and in *Saxony*.
- Jasponyx.* Consisting of jasper, and onyx.  
 Found rarely in *Saxony*, the *Palatinate*, and in the dutchy of  
*Ripontium*.
- albo-viridis* Consisting of quartz, and serpentine.  
 Found near *Sabla* in *Sweden*.
- tricolor.* Consisting of quartz, and red and black gypsum.  
*Born. ind. fess.* i. p. 86.  
 Found near *Marienberg* in *Saxony*, and is a matrix for tin ore.

63. BRECCIA. Consisting of fragments of stones,  
 generally of a rounded form, conglutinated by  
 an earthy or metallic cement: found only in  
 mountains of a more recent date.

*Pudding-stone.*

A. *With a talcose cement.*

- serpentina.* Consisting of smaller fragments of serpentine, conglutinated  
 by indurated micaceous marl.  
 Found in *Piedmont*.

B. *With a calcareous cement.*

- calcaria.* Consisting of fragments of common marble, conglutinated  
 by calcareous earth.  
 Found every where in valleys bounded by mountains of lime-  
 stone.
- marmorea.* Consisting of fragments of fine marble, conglutinated by  
 calcareous earth.  
*Marmo brecciato.* *Cronst. miner. sect.* 269. 1. 1.  
 Found in *Italy*, variegated, and admitting a very high polish.
- Lumachella* Consisting of shells, corals, or their fragments, congluti-  
 nated by calcareous earth.  
*Lumachella.* *Cronst. miner. sect.* 269. 1. 2.  
*Freber Br. auf. Welfschl.* 16. p. 257.  
 Found in *Italy*, *Norway*, *Sweden*, *Germany*, &c. is often finely  
 variegated, and admits a high polish.
- schistosa.* Consisting of fragments of shist, conglutinated by brown  
 alumina.  
*Saxum schistosum.* *Waller syst.* i. p. 430.  
 Found in *Westrogoth* and *Hunneburg*.

C. *With an argillaceous cement.*

- argillosa.* Consisting of fragments of trap, cemented by jasper.  
*Born. ind. fests.* 1. p. 156.  
 Found in *Norway*.
- basaltina.* Consisting of fragments of columnar basalt, conglutinated by alumina.  
*Nose orogr.* 1. p. 163.  
 Found on the banks of the lower *Rhine*, and in the mountains *Honderberg* and *Wolfberge*.
- lavina.* Consisting of fragments of lava, conglutinated by calcareous earth.  
*Cicerchina. Freber Br. a. Welschl.* 7. p. 96.  
 Found in *Italy*, near *Fieschi* in *Tuscany*, and is used for the purpose of polishing marble.

D. *With a siliceous cement.*

- helvetica.* Consisting of fragments of hornstone, agglutinated by marl.  
*Nagelfluh. Nagelfels. Andreæ Br. a. d. schw.* p. 36, &c.  
 Found principally in the southern and western parts of *Switzerland*, sometimes in detached pieces, sometimes in rocks and large masses, and is used as a material for buildings: it does not admit a polish, and has frequently the vestiges of animal relics impressed upon it, as sharks' teeth, &c.
- cornea.* Consisting of fragments of hornstone, conglutinated by alumina.  
*Born. ind. fests.* 1. p. 156.  
 Found near *Idria* in *Carniola*, and near *Schneeberg* in *Saxony*; in the latter place it has some portions of spar.
- mixta.* Consisting of fragments of hornstone and quartz, conglutinated by calcareous earth.  
 Found near *Anneberg* in *Saxony*.
- silicina.* Consisting of fragments of hornstone, flint, and quartz, conglutinated by a cement of jasper.  
*Saxum silicibus. Syst. nat.* xii. 3. p. 80. n. 39.  
*Saxum siliceum. Wall. syst.* 1. p. 428. n. 5.  
*Quartzose Pudding-stone. Soewerby Brit. min.* t. 92.  
*Pudding Stone. Kirwan mineral.* 1. p. 360.  
*Puddingstone. Schmeisser miner.* 1. p. 329.  
 Found in *Britain*, particularly in *Hertsfordshire*, and *Bohemia*: the pebbles are often variegated, and the cement grey or tawny: it receives a fine polish.

- fruticulosa*. Composed of yellow fragments of hornstone, marked with black and red shrub-like ramifications.  
*Pietra fruticulosa*. *Freber Br. a. Welschl.* 16. p. 259.  
 Found in the *East*.
- egyptia*. Composed of agglutinated fragments of green hornstone.  
*Breccia verde*. *Freber Br. a. Welschl.* 16. p. 259.  
 Found in *Egypt*, and receives hardly any polish: the green colour of the fragments is clearer or darker, and it is often mixed with fragments of granite.
- cuprifera*. Consisting of fragments of hornstone and quartz, conglutinated by copper ore.  
*Cronst. min. sect.* 275. 3. 1. 1.  
 Found in *Siberia*, often so rich in copper as to be worked with great profit.
- jaspidea*. Composed of fragments of jasper, with a jasper cement.  
*Saxum Jaspidis*. *Cronst. min. sect.* 270.  
*Saxum jaspideum*. *Wall. syst.* 1. p. 429.  
 Found near *Frejus* in *Provence*.
- quartzosa*. Composed of fragments of quartz, with a cement of quartz.  
*Saxum quartzos.* *Cronst. min. sect.* 270.  
*Saxum quartzosum*. *Wall. syst.* 1. p. 428. n. 4.  
 Found in *Femtia* and *Smoland* in *Sweden*.
- glandulosa*. Composed of fragments of quartz, with a cement of sandstone.  
*Saxum cotaceum*. *Syst. nat.* xii. 3. p. 73. n. 8.  
*Sax. arenario-silic.* *Wall. syst.* 1. p. 427. n. 3.  
 2. *Cos tigrina*. *Syst. nat.* xii. 3. p. 62. n. 4.  
 Found in *Sweden*, *Normandy*, and near *Goettingen* in *Germany*.
- indeterminata*. Composed of the fragments of various simple stones, with a predominancy of quartz.  
 Found every where in *Germany*.
- porphyrea*. Composed of fragments of porphyry, with a cement of jasper or porphyry.  
*Breccia porphyrea*. *Cronst. min. sect.* 273. 5. 1.  
*Saxum porphyreum*. *Wall. syst.* 1. p. 430. n. 8.  
 Found on mount *Hykieberg* in *Dalecarlia*, and the rock *Serna* on mount *Schwalbenstein* in *Henneberg*.
- arenaria*. Composed of the conglutinated fragments of sandstone.  
*Saxum fragmentis, &c.* *Cronst. min. sect.* 273. 5. 3.  
*Saxum arenarium*. *Wall. syst.* 1. p. 427. n. 2.  
 Found in *Dalecarlia* in *Sweden*.

*saxosa.* Composed of the fragments of various stones cemented together.

Breccia indeterminata. *Cronst. min. sect.* 273. 5. 2.

Saxum lapid saxof. *Wall syst.* 1. p. 430. n. 9.

Found in *Dalecarlia* and *Norman* and *Sweden*.

*sterilis.* Composed of the fragments of various stones, simple as well as aggregate, cemented together.

*Voigt. Verz. Samml. v. Gebirgs.* p. 15. n. 15, 16.

Found in the mountains of *Thuringia* and *Hesse*, under strata of bituminous marl.

64. ARENARIUS. Consisting of grains of sand cemented together: occurring in stratified mountains, and forming entire strata, rocks, hills, or mountains: generally of a common form, and breaking into indeterminate fragments.

*Sandstone.*

*A. Simplicior, with a siliceous cement.*

*flexilis.* Elastic, hard, apyrous, in somewhat scaly particles.

*Cos flexilis.* *Gassend. vit. Reiesc.* 1765. p. 155.

Elastischer Stein. *Bruchm. chem. ann.* 1784. 2. p. 441.

*Crell chem. ann.* 1785. 2. p. 479.

Found in *Brasil*: of a hoary colour, rough, and not effervescing with acids: in larger pieces it may be easily bent backwards and forwards, when it returns into its former position with a small spring and a slight degree of crackling noise: in a white heat it does not lose the least quantity of its weight, nor as far as respects its smaller particles, of its transparency.

*Avanturino* Hard, taking a fine shining polish, consisting of tawny grains unequally tinged.

*Daubenton Art. Par.* 1781. p. 1--7.

Avanturine. *Schmeisser mineral.* 1. p. 114.

Found in *Britain*, *Spain*, *Bohemia*, and *Saxony*.

*Cos.* Hardest, brittle, not taking a polish, consisting of lesser equal grains. *Grindstone.*

*Cos Cotaria.* *Syst. nat.* xii. 3. p. 61. n. 1.

*Cos arenacea.* *Wall. syst.* 1. p. 190.

Sandstone. *Schmeisser mineral.* 1. p. 324.

Siliceous sandstone. *Kirwan. miner.* 1. p. 364.

Sandstone. *Thomson chem.* 4. p. 140.

Found in *Britain* and various parts of *Europe*, of a rufous, yellowish, white, or grey colour; sometimes mixed with particles of mica, or containing vestiges of shells; it is chiefly used for grindstones, scythe-stones, and buildings, and is supposed to produce consumption in those who inhale its fine dusty particles.

*coagmentatus.* Porous, not filtering water, consisting of rather larger transparent grains.

Cos coagmentata. *Syst. nat.* xii. 3. p. 63. n. 9.

Siliceous sandstone. *Sowerby Brit. min.* t. 49, 50.

Found in various parts of *Europe*, and is more or less porous, with rigid transparent grains.

*feraminulentus.* Lightish, irregularly pitted, filtering water, consisting of smaller grains.

Cos partic. arenos. *Wall. syst.* 1. p. 198. n. 9.

Found in *Mgermannia*, where it is used for buildings.

*Filtrum.* Hard, filtering water, consisting of larger equal grains.

*Filtering-stone.*

Cos partic. arenac. *Syst. nat.* xii. 3. p. 63. n. 10.

Cos aquam transmittens. *Wall. syst.* 1. p. 197. n. 8.

Found in the *Canaries*, on the shores of *New Spain*, in *Saxony* and *Bohemia*, generally grey with pellucid angular grains.

Its chief use is to render salt waters sweet, or turbid ones clear.

*fundamentalis.* Hardish, consisting of unequal, angular, opaque, larger grains.

Cos. partic. angulos. *Syst. nat.* xii. 3. p. 64. n. 16.

Cos. partic. arenos. *Wall. syst.* 1. p. 195. n. 6.

Found in *Britain*, particularly in *Devonshire* and *Cheshire*, in *Sweden* and other parts; rigid to the touch, difficult to be cut into pieces, falling into sand in a small degree of heat: colour white, grey, greenish, brown, red, or yellowish: it is rather solid, and when cut horizontally is used for the foundation of buildings.

#### B. *With a calcareous cement.*

*crystallinus.* Hard, grey, in aggregate rhombic crystals united by a cement of spar.

*Laffone A&S. Par.* 1777. p. 43.

*Hacq. schr. berl. naturf.* 2. p. 142.

*Freber bemerk. in neufl. bet. Sc.* p. 51.

Found in several parts of *France*, and contains about 5 parts of sand to 3 of spar.

- stillatitius.* Hard, grey, in the form of a stalactite.  
*Lassone Atl. Par.* 1777. p. 43.  
 Found near *Fontainebleau* in *France*.
- margarita-* Consisting of transparent unequal grains, united by a ce-  
*rius.* ment of white chalk.  
*Saxum quartzosum.* *Syst. nat.* xii. 3. p. 74.  
 Found in *Nericia* in *Sweden*.
- Helena.* Friable, consisting of black and grey grains united by a  
 cement of white chalk.  
*Saxum calcareo-arenos.* *Syst. nat.* xii. 3. p. 73. n. 7.  
 Found in *St. Helen's*: friable, and exhibiting when burnt a  
 yellowish and sandy calx.
- livonicus.* Grey, hardening in the air, consisting of smaller grains  
 cemented by white chalk.  
*Lapis arenaceus, &c.* *Cronst. mineral. sect.* 274. 2. 2.  
*Quadrum albescens.* *Wall. syst. min.* 1. p. 192.  
*Calcareous sandstone.* *Kirwan miner.* 1. p. 362.  
 Found in *Livonia*, and becomes yellowish when burnt.
- scanicus.* In green transparent grains cemented by white marble.  
*Cronst. miner. sect.* 272. 2. 1.  
 Found near *Backerskog* in *Norway*.
- calcarius.* Grey, in lesser grains conglutinated by a cement of chalk.  
*Cos. partic. glareos.* *Syst. nat.* xii. 3. p. 62. n. 3.  
*Calx Nepatica.* *It. Wgoth.* 21.  
 Found in the mountain *Kinneulle* in *Sweden*, forming the lowest  
 stratum: when made red hot it flies to pieces with a violent  
 noise.
- Quadrum.* Hardish, consisting of lesser grains conglutinated by a ce-  
 ment of marl.  
*Cos. partic. glareos.* *Syst. nat.* xii. 3. p. 61. n. 2.  
*Cos. partic. impalpab.* *Wall. syst.* 1. p. 191. n. 4.  
 Found in *Britain, Germany, Sweden, France, &c.* grey, yel-  
 lowish, or reddish, and forming horizontal or oblique clefs: :  
 under ground it is moist and easily cut, but hardens when ex-  
 posed to the air, and at length moulders, is bibulous when  
 quite dry, and scales off in a frosty air. It is principally  
 used in architecture.
- sulphureus.* Consisting of grains conglutinated by a cement of swinq-  
 stone.  
*Schwefelstein.* *Heidinger Phys. Arb. cintr.* 1. 4. p. 7.  
 Found in the salt-pits of *Galicia*,

C. *With an argillaceous cement.*

- porcelanus.* Consisting of grains conglutinated by a cement of porcelane clay.  
 Cos partic. arenac. *Syst. nat.* xii. 3. p. 64. n. 14.  
 Lapis arenaceus. *Cronst. miner. sect.* 274. 1. 1.  
 Found in a coal-pit near *Bojerup* in *Norway*: under ground it is soft, but hardens when exposed to the air, and does not melt in the fire.
- Fablanensis* Consisting of minute white grains, with a cement of common rufous alumina.  
 Saxum cotac. rufum. *Syst. nat.* xii. 3. p. 74. n. 11.  
 Found at *Fablan* in *Sweden*, where it forms the base of copper mines.
- coloratus.* Consisting of smaller and nearly equal grains variouly tinged.  
 Cos colorata. *Syst. nat.* xii. 3. p. 64. n. 13.  
 Found scatteredly here and there, of a yellow, green, blue, or reddish colour, and may probably be only a variety of *A. ferruginosus*.
- stratarius.* Hard, consisting of equal transparent grains.  
 Cos partic. arenac. *Syst. nat.* xii. 3. p. 63. n. 12.  
 Found almost every where: it hardens in the air, and is salt when found under salt water.
- friabilis.* Consisting of minute grains slightly cohering.  
 Cos partic. friabil. *Syst. nat.* xii. 3. p. 63. n. 8.  
 Found at *Helsingburg* in *Norway*.
- fissilis.* Separable into tables or plates.  
 Cos fissilis. *Syst. nat.* xii. 3. p. 62. n. 7.  
 Cos fissilis. *Wall. syst.* 1. p. 196. n. 7.  
 Found in *Britain*, *Sweden*, *Spain*, *Germany*, &c. varying much in degrees of hardness, size and transparency of its grains, thickness of the plates into which it may be separated, and colour, but is generally whitish or reddish. It may be used for tiling, unless it be too porous.
- glareosus.* Soft, consisting of very minute grains.  
 Cos glareosa. *Wall. syst.* 1. p. 188. n. 2.  
 Found commonly in *Britain*, *Sweden*, and *Peru*: colour grey, reddish, yellowish, or greenish.

D. *With a metallic oxyde supplying the place of a cement.*

- amnigenus.* Hard, consisting of grains conglutinated by a cement of a small quantity of oxyde of iron.  
 Saxum lapillis, &c. *Syst. nat.* xii. 3. p. 80. n. 38.



Lapis arenac. ochra, &c. *Cronst. min.* 274. 4.

Found in *Sweden* and *Germany*, of a red or yellow colour. The inhabitants near the river *Haukipudas* in *Ostrobothnia*, dig the sand from the bottom of the river, collect it into heaps, and leave it for a year or two to the influence of the atmosphere, when it becomes so impregnated with iron that they form their hearths of it.

*ferruginosus.* Consisting of grains conglutinated with a larger portion of oxyde of iron.

Ferruginous sandstone. *Kirwan mineral.* 1. p. 365.

Sandstone. *Sowerby Brit. min.* 1. p. 119. t. 55.

Found in *Britain* and *Germany*, of a brownish or yellowish colour, and is frequently impressed with the casts of shells. It is sometimes so rich in iron ore as to be worked with advantage,

*cobaltifer.* Consisting of grains conglutinated by oxyde of cobalt.

*Cronst. miner. sect.* 276. 3.

Found in the mines of *Germany*.

*cuprifer.* Consisting of grains conglutinated by a cement of oxyde of copper.

*Cronst. miner. sect.* 276. 2.

Found in the mines of *Siberia* and *Hesse*.

#### E. More compound.

*griseus.* Composed of unequal grains cemented by indurated alumina, with frequently fragments of quartz and slate.

*Chem. annal.* 1785. 2. p. 431. & 1786. 2. p. 241.

Granwacke. *Lafius boeb.* 1. p. 141.

Found in the *Ural* mountains of *Siberia*, in those of *Saxony* and other parts of the continent, in strata alternating with layers of slate and lydian stone, and is often rich in metallic veins: the argil is blueish-grey tending to black; the grains generally white, rarely greenish or red, but varying much in size and proportion: sometimes it contains spar, or bitumen, or the vestiges of animal or vegetable substances, with rarely a little mica.

*novacularis* Consisting of smaller grains mixed with mica.

Saxum cotaceum. *Syst. nat.* xii. 3. p. 74. n. 12.

Cos saxosa. *Wall. syst. miner.* 1. p. 193. n. 5.

Whetstone, *Schmeisser miner.* 1. p. 327.

2. Saxum stenonis. *Syst. nat.* xii. 3. p. 75. n. 13.

3. Saxum undulatum. *Syst. nat.* xii. 3. p. 74. n. 9.

Found every where in mountains and hills of sand, especially those of a more recent date: colour reddish, yellowish, ru-

fous; the mica white or black, and disposed longitudinally or in dots: it has generally a slaty, sometimes an undulately slaty texture, and may easily be separated into plates: it is found in layers, and when broken, has a rather glittering clayey appearance, exhibiting mostly a fine grain.

- molaris.* Hard, consisting of unequal angular grains of quartz and feldspar interspersed with mica.  
 Cos particularis, &c. *Syst. nat.* xii. 3. p. 64. n. 15.  
 Cos partic. major. *Wall. syst.* 1. p. 199. n. 10.  
 Mill-stone. *Schmeisser mineral*, 1. p. 328.
2. Containing garnets or crystallized shorl.  
 Saxum molinum. *Syst. nat.* xii. 3. p. 75. n. 17.  
 Found generally through *Eurepe*: is of a very hard texture, and is used for corn-mills: the grains of quartz are transparent, generally white, and larger; those of the feldspar are less, more opaque, and grey.
- compactus.* Hard, consisting of grains of ochre-yellow quartz and red garnets.  
 Cos partic. arenac. *Syst. nat.* xii. 3. p. 63. n. 11.
2. Fissile, and mixed with silvery mica.  
 Saxum punctatum. *Syst. nat.* xii. 3. p. 78. n. 28.  
 Found in *Dalecarlia* and *Westrogoth* in *Sweden*, and is used as a coarser kind of mill-stone.
- radians.* Hard, variegated with columns of black shorl disposed in a stellate manner, and interspersed with grains of purple garnets.  
 Sax. cotac. striis atris. *Syst. nat.* xii. 3. p. 74. n. 10.  
 Found in *Sweden*, of a pale colour.
- decussatus.* Hard, reddish-white, varied with black erect and decussating scales of hornblend.  
 Saxum cotaceum, &c. *Syst. nat.* xii. 3. p. 75. n. 15.  
 Found at *Killmorac* in *Sweden*.
- frumentalis.* Varied with interspersed foliations and lanceolate spots of talc.  
 Sax. coraceo-talcos. *Syst. nat.* xii. 3. p. 75. n. 16.  
 Found in *Germany*.
- variolosus.* White, in small grains, filtering water, with ferruginous perforations. *Tiger-stone.*  
 Cos partic. glareos. *Syst. nat.* xii. 3. p. 62. n. 5.  
 Found in *Nericia* and *Westrogoth* in *Sweden*: the spots and perforations originate from small pieces of pyrites imbedded, and which moulder into an ochraceous oxyde.

## CLASS II. SALTS.

65. NATRUM. Of a caustic taste; effervescing with acids.
66. BORAX. Frothing in the fire, and in a strong heat melting into a transparent glass.
67. MURIA. Of a salt taste, easily soluble in water, changing nitrous acid into the nitromuriatic acid.
68. NITRUM. Of a cool sharpish taste, when moistened with very strong sulphuric acid emitting red vapours.
69. MIRABILE. Producing liver of sulphur in a white heat with powdered charcoal: its watery solution not rendered turbid by a mixture of carbonate of soda.
70. AMARUM. Of a bitter taste: its watery solution becoming milky by a mixture of carbonate of soda.
71. ALUMEN. Of a sweetish and very astringent taste: its watery solution not made turbid by prussiate of soda.
72. VITRIOLUM. Of an acid astringent taste: its watery solution made turbid by a mixture of carbonate of soda or prussiate of soda.

## SALTS.

65. NATRUM. Of a caustic taste, effervescing with acids, with oil forming soap, changing blue vegetable juices green, rendering acid solutions of earths and metals turbid.

*antiquorum.* Inodorous, dry, nearly pure.

Natrum nudum. *Syst. nat.* xii. 3. p. 88. n. 1.

Alcali orientale. *Wall. syst.* 2. p. 61. n. 1.

Alcali minerale. *Cronst. sect.* 135. 1. 1.

Soda, Mineral alkali. *Schmeisser miner.* 1. p. 266.

Soda. *Thomson chem.* 1. p. 475.

Natron, Mineral alkali. *Kirwan mineral.* 2. p. 6.

Found in China, Bengal, Persia, Syria, Egypt, South America, Denmark, Switzerland, and Hungary, generally during the spring and summer in a state of whitish efflorescent powder, and most usually combined with a greater or less portion of earth, common salt, acid, and various substances: it is totally soluble in water, and after evaporation runs into 4-sided prismatic crystals terminating each side in a needle-like point, which on exposure to the air soon moulder into a snowy impalpable powder: with quicklime and oil it forms soap, it easily melts in the fire, and with silica forms glass.

*acidulare.* Inodorous, dissolved in water.

Alcali miner. in acidulis. *Wall. syst.* 1. p. 63. n. 2.

Found in the warm and acidulous baths of Seltzer and various parts of Germany, and in the lakes between Alexandria and Rosetta.

*murorum.* Inodorous, mixed with carbonate of lime.

Natrum nudum. *Syst. nat.* xii. 3. p. 88. n. 2.

Alcali calcarea. *Wall. syst.* 2. p. 65. n. 3. 1.

Aphronitum. *Wolfersd. min.* 300.

2. Natrum marmoris. *Syst. nat.* 1. p. 161. n. 1.

Sal calcarium. *It. Oel.* 147.

Found in old walls cemented by lime, and sometimes in marble rocks, efflorescing like frost, and is not totally soluble in water.

*volatile.* Fetid, mixed with earths and other salts.

Alcali volatile. *Cronst. min. sect.* 141. 2. *Wall. syst.*

Aphronitum foetens. *Wall.* 2. p. 66. n. 1. Halinitron.

Volalkali. *Kirwan mineral.* 2. p. 7.

Found in various soils, in chalk, swinestone, argils, and often in the natron of old walls: its odour originates in the ammonia of decayed living bodies.

66. BORAX. Of a slightly caustic taste; rather ponderous, semitransparent, shining, inodorous, fixed: requiring a large quantity of water to dissolve it, and the solution not rendered turbid by a mixture of soda: frothing in the fire, and at last melting into a transparent glass still soluble in water.

*sedativa.*

Rather pure, not combined with soda

*Sale sedativo naturale. Hoefler Flor. 1778. 8.*

Found in *Tuscany*, partly dissolved in water, partly in the form of white or dirty-coloured small rounded pieces, or adhering to the mud at the bottom of some lake of *China*: combined with soda it forms a perfectly neutral salt called *sedative salt*, which is composed of light silvery flakes a little greasy to the touch, but hardly forming genuine crystals: it is soluble in spirits of wine, to which it communicates a green colour.

*Tincal.*

Combined with a large proportion of soda, mouldering in the air.

Borax nudus. *Syst nat xii. 3. p. 94 n. 1.*

Borax crudus. *Wall. syst. 2. p. 82 85. n. 1, 2.*

Poun. *At. Stockh. 34. p. 317. 319.*

*Philos. Transf. 1787. p. 298. 1789. p. 96.*

Borax Tincal. *Kirwan miner. 2 p. 37.*

Borax Tincal. *Schneijer mineral. 1. p. 281.*

Sub-bort of soda. *Thomson chem. 2. p. 341.*

Found in *India* and *Japan*, in the kingdoms of *Tibet* and *Peru*, sometimes in the form of solid grains and small roundish lumps forming in their solution minute semitransparent crystals, sometimes held in solution and found in vast masses mixed with the mud at the bottom of the lakes after the water has been dried up: it is soluble in 12 times its weight of water at a temperature of 60°, but of boiling water it requires only 6: when dissolved and slowly evaporated it shoots into hard transparent very finely transversely striate crystals, which are 6 or 4-sided, terminated both ways by a 3-sided pyramid: when heated it swells, and is at first converted into a white opaque frothy mass, but in a stronger heat becomes a transparent glass: when two pieces are struck together in the dark, a flash of light is emitted: specific gravity 1,740. contains acid 39. soda 17. water 44. *Bergman.*

67. MURIA. Of a salt taste: easily soluble in water and the solution not made turbid by soda: not effervescing with diluted acids, but effervescing and emitting grey ill-favoured suffocating vapours in strong hot sulphuric acids: changing nitrous acid into the nitromuriatic acid.

*aquatica*, Fixed, decrepitating when heated, of a cubic form, dissolved in water.

1. Held in solution in the waters of the ocean.

Muria marina. *Syst. nat.* xii. 3. p. 98. n. 1.

Muria marina. *Wall. syst.* 2. p. 55. n. 4. a, b, d.

Sal marinum. *Cronst. min. sect.* 130.

2. Held in solution in salt lakes.

Muria lacustris. *Cartheuf. min.* 37.

Sal marin, lacuum. *Wall. syst.* 2. p. 56. n. 4. c.

3. Held in solution in salt springs.

Muria fontana. *Syst. nat.* xii. 3. p. 98. n. 2.

Muria fontana. *Wall. syst.* 2. p. 57. n. 5.

Sal fontanum, *Cronst.* 131. *Wolderfd. min.* 23.

Found in the ocean, salt lakes, &c. and when evaporated generally contains from 20 to 30 per cent. of muriate of soda.

*montana*, Fixed, decrepitating in the fire, dry, pure, producing sulphate of soda when saturated with sulphuric acid.

Muria fossilis. *Syst. nat.* xii. 3. p. 98. n. 3.

Muria fossilis. *Wall. syst.* 2. p. 53. n. 1.

Sal. montanum. *Cronst. min. sect.* 129.

Common salt, Sal gem. *Kirwan mineral.* 2. p. 31.

Rock salt. *Schmeisser miner.* 2. p. 277.

Muriat of soda. *Thomson chem.* 2. p. 312.

1. Crystallized in cubes. *Sowerby Brit. min.* t. 22.

2. Of a common form.

Fibrous.

Compact.

3. In a stalactitical form.

Found in *Britain, Poland, Hungary, Spain*, and various other countries, sometimes forming vast masses and mountains: it is found colourless, and of various shades of grey, yellow, red, blue, or brown: it is frequently contaminated by a mixture of muriate of lime, muriate of magnesia, or other

earths, and may be purified by dropping into it first a solution of carbonate of barytes, then of carbonate of soda, as long as any præcipitate continues to fall; then separate the præcipitate by filtration, and evaporate slowly till the salt crystallizes: it is soluble in something less than three times its weight of water: specific gravity 2,120. contains acid 52. soda 42. water of crystallization 6. *Bergman.*

*impura.*

Fixed, decrepitating in the fire, dry, producing sulphate of soda when saturated with sulphuric acid, mixed with various earths.

1. Muria terra mineralis. *Wall. syst. 2. p. 54. n. 2.*

2. Muria lapide mineralis. *Wall. syst. 2. p. 55. n. 3.*

Muriat of alumina. *Thomson chem. 2. p. 331. Kirwan 2. p. 36.*

Found in the *Nevil Holt waters* and in the salt-pits of *Salzburg*, and is a coarser variety of the last from its being much mixed with gypsum, common mould, clay and other earths: its taste is astringent.

*febrifuga.*

Fixed, decrepitating in the fire, forming muriate of potash with sulphuric acid.

*Proust. beytr. 2. Chem. ann. 3. p. 446.*

Muriated Tartarin. Salt of Sylvius. *Kirwan 2. p. 50.*

Muriate of Potash. *Schmeisser mineral. 1. p. 278.*

Muriat of Potash. *Thomson chem. 2. p. 311.*

Found in the environs of *Madrid*, and in some mineral waters in *Normandy*: it has a disagreeable bitterish taste, and when dissolved and crystallized forms cubes which are often irregular: it was formerly known in the shops by the name of *febrifuge* or *digestive salt*: specific gravity 1,836. contains acid 31. potash 61. water 8. *Bergman.*

*ammoniaca.* Of an acrid pungent urinous taste, when heated subliming into a white smoke, rubbed with quicklime exhaling an alkaline odour, its crystals deliquescent in the air.

Sal alcali volatili saturatum. *Cronst. mineral. 132.*

Sal ammoniac. *Kirwan mineral. 2. p. 53.*

Muriate of Ammonia. *Schmeisser min. 1. p. 278.*

Muriat of Ammonia. *Thomson chem. 2. p. 324.*

Common Sal ammoniac. *Berkenhout Outl. 1. p. 253.*

1. Concrete in flowers or thin layers.

*Wall. syst. min. 2. p. 77. n. 1.*

2. Concrete in small compact masses.

*Wall. syst. min. 2. p. 78. n. 2.*

Found in coal-pits in various parts of *Britain*, but principally in the interior parts of *Asia* and *Africa*, and in the neighbourhood of volcanoes; rarely pure, white, and transparent,

generally of a yellowish-grey, apple-green or brownish-black colour: it dissolves in about three times its weight of water, and when slowly evaporated forms flexible spicules connected together like the web of a feather: specific gravity 1,420. contains acid 42,75. ammonia 25,00. water 32,25. *Kirwan.*

*Barytes.* Fixed, decrepitating in the fire, of an acrid astringent taste, precipitating sulphate of barytes when dropt into a weak watery solution of sulphuric acid.

Muriated Barytes. *Kirwan mineral. 2. p. 34.*

Muriat of Barytes. *Thomson chem. 2. p. 309.*

Found in some mineral waters of *Sweden*, and when evaporated forms 4-sided prisms whose bases are squares, or tables. It is sometimes used in scrofulous affections in doses of from 5 to 20 drops; but much precaution is necessary in its exhibition as, like all other barytic salts, it is poisonous. Specific gravity 2,8527. contains, in a state of crystallization, acid 20. barytes 64. water 16. When dried it contains acid 23,8. barytes 76,2. *Kirwan.*

*Strontiana.* Of a sharp penetrating taste, when heated undergoing a watery fusion, and afterwards becoming a white powder, precipitated from its watery solution by muriatic acid.

Muriat of Strontian. *Thomson chem. 2. p. 320.*

Perhaps never found naturally combined, but is prepared by dissolving carbonate of strontian in muriatic acid: its crystals are long slender 6 sided prisms which are soluble in two parts of water, and also in alcohol, to whose flame they give a purple tinge: specific gravity 1,4402. contains acid 23,6. strontian 36,4. water 40,0. *Bergman.*

*Calcareæ.* Of a bitter taste, swelling and melting and losing its water of crystallization in heat, and after having been exposed to a violent heat shining in the dark.

Muriated Calx. *Kirwan miner. 2. p. 35.*

Muriate of lime. *Schmeijser. mineral, 1. p. 297.*

Muriat of lime. *Thomson chem. 2 p. 322.*

Found in mineral waters, but generally combined with common sea-salt, to which it gives a bitterish taste, and which it causes to attract moisture and melt speedily in the air: its crystals are 6 sided striate prisms terminated by very sharp pyramids: its earth is precipitated by sulphuric acid: specific gravity 1,76. contains acid 31. lime 44. water 25. *Bergman.*

*Magnesiata.* Of a very bitter taste, soluble in its own weight of water, its saturated solution quickly forming a jelly on which if hot water be poured spongy masses are formed.



Muriated magnesia, Marine epsom. *Kirwan min.* 2. p. 35.

Muriat of magnesia. *Thomf. chem.* 2. p. 326.

Found in salt and other mineral springs, and abounds in the waters of the sea: its solution is precipitated by caustic alkalies and not visibly by the sulphuric: it very speedily deliquesces in the air, and when dried in a high temperature is very caustic: specific gravity 1,601. contains acid 34. magnesia 41. water 25. *Bergman.*

68. NITRUM. Of a sharp, bitterish, cooling taste: easily soluble in water, and the solution not made turbid by a mixture of soda: not effervescing with diluted acids, but when saturated with concentrated sulphuric acid emitting sharp suffocating red vapours: detonates violently when made red hot and charcoal is thrown upon it.

*nitrum.* Fixed, pure, not deliquescing in the air, when dissolved and slowly evaporated crystallizing into 6-sided prisms terminated at each end by an unequal 6-sided pyramid.

*Zimmerman voyage à la nitriere.* 1789. 8.

*Fortis del nitro minerale.* 1787. 8.

Nitre. *Kirwan mineral.* 2. p. 25.

Nitre, Saltpeter. *Schmeisser miner.* 1. p. 275.

Nitrate of Potash. *Thomson chem.* 2. p. 401.

Found in *Virginia, Spain, Sicily, India, Persia, and China*: white, of a cooling taste and resisting putrefaction: is very brittle, and soluble in seven times its weight of water: when exposed to a strong heat it melts, and congeals by cooling into an opaque mass: detonates very violently with combustible bodies, particularly with phosphorus. Its principal use is in the composition of *Gun-powder*, which is made by mixing together 76 parts of nitre, 15 of charcoal, and 9 of sulphur: these ingredients are first reduced to a fine powder, mixed well together, and reduced to a thick paste with water: after being a little dried, it is forced through a sieve with small holes, and thus made into grains: these grains when properly dried, are put into barrels which turn on their axes, by which means the asperities are worn off and the surfaces made smooth. Specific gravity 1,9369. contains acid 31. potash 61. water 8. *Bergman.*

*humosum.* Fixed, not deliquescent in the air, when dissolved and slowly evaporated crystallizing into 6-sided prisms terminating at each end in a 6-sided unequal pyramid, efflorescing, mixed with mould or chalk.

Nitrum humosum. *Syst. nat.* xii. 3. p. 84. n. 1.

Nitrum mineralifatum. *Wall. syst.* 2. p. 45. n. 1.

Found, generally in a state of white efflorescence, on moist old walls which are but little exposed to the action of the sun and winds, as in wells, grottos, &c. especially those which face towards the sea.

*cubicum.* Fixed, when dissolved and evaporated concreting into rhombic crystals.

*Nauwerk Chem. annal.* 1784. 2. p. 314.

Found, though rarely, in caves with the last, efflorescing from the moist sides of walls.

*flammans.* Evaporating in smoke when thrown on red hot coals, emitting an alkaline odour when rubbed together with quicklime, deliquescent in the air.

Nitrum semivolatile. *Cronst. miner.* 38.

Found with the Nitrum humosum.

69. MIRABILE. Of a bitter taste; not easily soluble in cold water, and the solution not made turbid by a mixture of soda: not effervescent with any acid: exposed to a white heat with powdered charcoal producing an alkaline sulphur.

*genuinum.* Of a cooling taste, easily melting in the fire, when dissolved and slowly evaporated crystallizing into very transparent unequally 6-sided prisms which moulder in the air.

Natrum fortan. saturat. *Syst. nat.* xii. 3. p. 89. n. 3. d.

Sal neutrum composit. *Wall. syst.* 2. p. 70. n. 1.

Glauber's salt. *Berkenb. outl.* 253.

Glauber's salt. *Kirwan miner.* 2. p. 9.

sulphate of soda. *Schmeisser mineral.* 1. p. 267.

Sulphat of soda. *Thomson chem.* 2. p. 349.

Found in many mineral waters of *Britain* and other parts of *Europe*, sometimes dry, rarely in a crystallized state, sometimes in a state of white efflorescence on moist walls, in vast quantities under the surface of the earth in the neighbourhood of *Astracan*, and in summer at the bottom of lakes: it is

seldom found pure, but usually mixed with soda, common salt, Epsom salt, or selenite: the sides of the crystals are commonly grooved, and when exposed to a warm atmosphere they soon lose their transparency and water of crystallization, and fall into a white opaque powder: when exposed to heat it first melts, and after the evaporation of its water becomes a white powder, and in a red heat melts. Its use as a cooling purgative is sufficiently known. Contains acid 27. soda 15. water 58. *Bergman.*

*potassium.* Of a bitterish taste, decrepitating when placed on hot coals and melting in a red heat, soluble in 16 times its weight of cold water, its crystals not mouldering in the air.

*Proust beytr. chem. annal.* 3. p. 466.

Tartar vitriolate. *Kirwan miner.* 2. p. 8.

Sulphat of Potass. *Thomson chem.* 2. p. 347.

2. With an excess of acid.

Superfulphat of Potass. *Thomson chem.* 2. p. 349.

Found in various parts of *Spain*, of a greyish-white colour, and sometimes luminous in the dark: when its diluted solution is evaporated it affords 6-sided pyramids, or short hexangular prisms terminated by one or more hexangular pyramids: the the superfulphate of potass from its excess of acid turns blue vegetable juices red, and is soluble in twice its weight of water. It was formerly used as a purgative; under the name of *Sal polychrest* and vitriolated tartar. Specific gravity 2.298. contains acid 40. potass 52. water of crystallization 8. *Bergman.*

*semivolatile* Of an acid taste, evaporating in fumes when heated, deliquescing in the air, emitting an alkaline odour when rubbed together with quicklime.

Found rarely in the vicinity of volcanic mountains.

*sulphureum.* Evaporating in fumes when heated, deliquescing in the air, when rubbed together with quicklime emitting an alkaline odour, and when sprinkled with nitric acid an odour like burnt sulphur.

Vitriolic ammoniac. *Kirwan miner.* 2. p. 10.

Sulphuric acid united to ammonia. *Schmeisser.* 1. p. 268.

Sulphat of ammonia. *Thomson chem.* 2. p. 356.

Found in the neighbourhood of volcanos, in some lakes in *Tuscany*, at the bottom of a burning well in *Dauphigny*, and on the surface of the earth near *Turin*. It is generally found mixed with sulphur, alumina, alum, or vitriol, and hence its

colour is seldom white, but of a grey, yellowish-grey, or lemon-colour: it is also found in a stalactical form, or investing lavas, or in an earthy state with little or no lustre: its crystals are generally small 6 sided prisms whose planes are unequal, terminated by 6 sided pyramids: it is soluble in twice its weight of cold water, and slowly attracts moisture when exposed to the air: when heated it first decrepitates, then melts, and in close vessels sublimes: contains acid 54,66. ammonia 14,24. water 31,10. *Kirwan*.

70. AMARUM. Of a bitter taste: easily soluble in water, and the solution becoming milky by a mixture of soda: easily melting in heat, but neither detonating or decrepitating.

*genuinum*. Foaming in the fire, when dissolved and evaporated crystallizing into 4-sided prisms terminating each side in a 4-sided pyramid, and which wither when exposed to the air.

Natrum epsamense. *Syst. nat. xii. 3. p. 89. n. 3.*

Sal neutr. composit. *Wall syst. 2. p. 71. n. 2.*

Epsom salt. *Kirwan miner. 2. p. 13.*

Epsom salt, Bitter salt. *Schmeisser miner. 1. 269.*

Sulphat of magnesia. *Thomson chem. 2. p. 357.*

Found in many mineral waters of *Britain* and other parts, at *Jena* on gypsum, in *Switzerland* in a powdery state, sometimes in a state of incrustation covering the surface of the earth, in sea-water it abounds and frequently renders the salt prepared from it bitter: its crystals are 4-sided prisms whose faces are equal, ending in 4-sided pyramids or 2-sided summits: before the blowpipe it melts with difficulty into an opaque glassy globule. Its use is well known as a purgative; and the magnesia of the shops is prepared from it, by dissolving it in water, and precipitating the magnesia contained in it by means of alkalies. Specific gravity 1,66. contains acid 33. magnesia 19. water 48. *Bergman*.

*muriaticum*. Deliquescent in the atmosphere, emitting acrid cinereous vapours of a disagreeable odour when sulphuric acid is poured on it, or it is exposed to a considerable degree of heat.

Found plentifully in salt-waters, springs and lakes, and converts nitric acids into nitro-muriatic acid: it is also soluble in alcohol.

*calcarium.* Deliquescing in the atmosphere, emitting acrid grey vapours of a disagreeable odour when sulphuric acid is poured on it, but not when exposed to a violent heat.

Terra calcarea acido, &c. *Cronst min. sect.* 21.

Sal neutrum terra comp. *Wall. syst.* 1. p. 75. n. 6.

Found in the ocean and other saline waters, and sometimes in a dry state: like the last it converts nitric acid into nitromuriatic acid, and is soluble in alcohol; its solution becomes lactescent by dropping vitriolic acid into it.

*nitrosam.* Deliquescing in the atmosphere, emitting red vapours when hot concentrated vitriolic acid is poured on it, its watery solution not made turbid by the vitriolic acid.

Nitrated calx? *Kirwan miner.* 2. p. 29.

Found mixed with soil and on old walls, and sometimes effloresces with the Nitrum humosum: in the fire it swells with crackling noise, but does not detonate when thrown on hot coals: is soluble in alcohol: after evaporation from its watery solution it crystallizes into 4-sided oblique truncate prisms.

*murale.* Deliquescing in the atmosphere, emitting red vapours when concentrated cold sulphuric acid is poured on it, its watery solution made turbid by the vitriolic acid.

Nitrum terra calcar. mixt. *Wall. syst.* 2. p. 46. n. 2?

Found generally with the Nitrum humosum, and is likewise soluble in alcohol.

*animale.* Not deliquescing in the atmosphere, not easily melting in the fire, but emitting red vapours by the force of fire only.

*Sage Ad. Paris.* 1777. p. 433.

Found with the Nitrum humosum, and is composed of the phosphoric acid and nitre.

**71. ALUMEN.** Of a sweetish and very astringent taste: its watery solution made turbid by soda, but not by prussiate of lime: tumefying and losing its transparency when exposed to heat, and becoming a spongy mass after losing its water of crystallization.

*phosphoreum* Flying to pieces when exposed to a violent heat, consisting of phosphoric acid and alumina.

Grenat de Valence. *Proust. chem. ann.* 1. 8 p. 196.

Phosphat of Alumina. *Thomson chem.* 2. p. 365.

Found in *Valentia*: a tasteless powder, not soluble in water: yields a gritty powder when dissolved in phosphoric acid, and a gummy solution which is converted by heat into a transparent glass. It does not seem to belong to this genus.

*muriaticum.* Exposed to a violent heat, or moistened with strong sulphuric acid, emitting acrid grey vapours of a disagreeable odour.

Found in *Tuscany*, efflorescing on the surface of aluminous soils like powder, in dry seasons, also in the mouths of caves and fissures of rocks with the appearance of wool or a white crust: its taste is rather bitter than astringent.

*nativum.* Pure, dry, not emitting vapours when sulphuric acid is poured on it.

Alumen nudum. *Syst. nat.* xii. 3. p. 101. n. 1.

Alumen nativum. *Wall. Jyst.* 2. p. 32. n. 1.

Alum. *Kirwan* 2. p. 13. *Schmeisser min.* 1. p. 270.

Alum. *Thomson chem.* 2. p. 364.

1. In the form of an efflorescent powder.
2. Of a common form, solid, without lustre.
3. In a stalactitical form, solid, without lustre.
4. Solid, of a silky lustre, fibrous internally.
5. Crystallized in a double 4-sided pyramid.

Found in *Egypt*, the islands of the *Archipelago*, *Malta*, *Sicily*, in the craters of volcanos, the alps of *Switzerland* and the lakes of *Tuscany*, and in various parts of *Europe* in aluminous shist: it is dissolved in 34 times its weight of cold water, and easily forms crystals which effloresce a little in the air: when exposed to a strong heat it sublimes, swells, foams, loses its transparency, and at last loses 44 per cent. of its weight: its solution always turns vegetable blues red: specific gravity 1,7109. contains sulphate of alumina 49. sulphate of potash 7. water 44. *Vauquelin*.

- solutum.* In a state of solution, not emitting vapours when sulphuric acid is poured on it.  
*Richter chem. annal.* 1788. 1. p. 374.  
 Found in many parts of *Siberia* and *Italy*.
- Halotrichum.* Dry, fibrous, of a silky lustre, not deliquescent in the atmosphere, nor emitting vapours when sulphuric acid is poured on it.  
*Scopol. de Hydrarg. Idriens.* 1761. p. 68.  
 Capillary Alum. *Kirwan miner.* 2. p. 13.  
 Hair salt. *Schmeisser mineral.* 1. p. 270.  
 Found in the quicksilver mines of *Idria*, the lakes of *Tuscan*, in *Italy*, *Sicily*, *Hungary*, and the coal-mines near *Whitchaven*; the crystals are tender capillary silvery-white filaments, generally parallel and incurved, rarely disposed in a stellate manner, which frequently adhere together and form compact pieces; these, after exposure to the air, lose their transparency and become more or less of a yellowish or greenish hue.
- butyraceum.* Of a yellow colour in its native foil, soft and fat to the touch, hardening in the air and becoming white, of a waxy lustre, lamellar.  
 Stone butter. *Kirwan mineral.* 2. p. 14.  
 Mountain butter. *Schmeisser mineral.* 1. p. 271.  
 Found in *Siberia* and *Upper Lusatia*, oozing from the surface of aluminous slits: it is a little semitransparent, soft and friable, but becomes brittle by exposure to the air, and contains decomposed sulphate of iron as well as alum.
- terreum.* Combined with soft alumina, not emitting vapours when sulphuric acid is poured on it.  
 Alumen terra mineralis. *Wall. syst.* 2. p. 23. n. 3.  
 Found in the vicinity of volcanic mountains, and in various parts of the continent: colour rarely white, brown or black when the earth with which it is combined is mixed with bitumen, in which case it flames in the fire and gives out a disagreeable odour like burnt peat: sometimes it spontaneously hardens in the atmosphere and exhibits its alum in a state of efflorescence.
- romanum.* Adhering to the tongue, soiling the fingers, not emitting vapours when sulphuric acid is poured on it, combined with indurated purer alumina.  
 Alumen marmoris. *Syst. nat.* xii. 3. p. 102. n. 3.  
 Alumen lapide calcar. *Wall. syst.* 2. p. 34. n. 4.  
 Aluminous ores. *Kirwan miner.* 2. p. 15.  
 Roman alum. *Thomson chem.* 2. p. 364.  
 Rock alum. *Schmeisser miner.* 1. p. 173.

Found in *Britain* near *Whithy*, in *Switzerland*, *Tuscany*, and at *La Tolfa* near *Rome*, forming strata or vast masses, with frequently small lumps of pyrites or sulphate of iron interspersed, and having sometimes veins of white quartz running through it: does not effervesce with acids, is of a white, grey, pearly, or rosy colour, and produces alum upon combustion or after long exposure to the air.

*commune.*

Not emitting vapours when sulphuric acid is poured upon it, mixed with bituminous shist.

Alumen schisti. *Syst. nat.* xii. 3. p. 101. n. 2.

Alumen lapide fissile mineral. *Wall.* 2. p. 35. n. 6.

Agilla martialis. *Cronst. miner. sect.* 124. 2. 3.

Slaty and compact Alum ores. *Kirwan miner.* 2. p. 19.

Aluminous earth. *Schmeisser miner.* 1. p. 171.

Alumina. *Thomson chem.* 1. p. 519.

1. Very soft to the touch, meagre, breaking into trapezoid fragments.

Shist. aluminos. lamellos. *Cronst. min.* 124. 2. 3. 1.

*Karst. magaz. Helv. natur.* 3. p. 204.

*Hoffm. Bergm. Journ.* 1788. 2. p. 550.

2. Hardish, shining internally, undulately slaty, a little greasy to the touch, breaking into indeterminate fragments.

Schist. aluminar. undulat. *Cronst. min.* 124. 2. 3. 2.

*Karst. magaz. Helv. natur.* 3. p. 205.

*Hoffm. Berg. Journ.* 1788. 2. p. 501.

3. Slightly effervescing with acids.

Alum. lapide calcareo. *Wall. syst.* 2. p. 35. n. 5.

Found in the neighbourhood of coal-mines in various parts of *England*, *Scotland*, and *Wales*, in *Siberia*, *Norway*, *Sweden*, many parts of *Germany*, &c. forming vast mountains, and strata over coals and iron ore; it is also found in small flatted spherical masses, containing small particles of sulphuret of iron in the form of pyrites: colour black, gives a dark grey streak, adheres a little to the tongue: texture slaty, sometimes straight, sometimes curved, and has a sweetish and somewhat astringent taste, and is apt to wither in the air into a dull grey powder. It is used in alum works.

*turfæ.*

Not emitting vapours when sulphuric acid is poured upon it, mixed with turf.

Alumen turfa mineralis. *Wall. syst.* 2. p. 33.

*Swab. Act. Stockh* 28. p. 37. *Kirwan min* 2. p. 20.

Found near *Ellsmburg* in *Sweden*, and in *France*, and consists of turf so impregnated with sulphuret of iron as to yield a small portion of alum.



72. VITRIOLUM. Of a very caustic taste: its watery solution made turbid both by soda and prussiate of lime: very soft, mouldering in the air: dissolving like water when exposed to heat, and in a very strong degree leaving a genuine metallic oxyde.

*magnesii.* Of a rosy-red colour, its watery solution depositing an ochraceous sediment when dissolved soda is poured into it, and a greenish one when a solution of prussiate of lime is poured into it.

Sulphate of Cobalt. *Schmeisser miner.* 1. p. 274.

Sulphat of Cobalt. *Thomson chem.* 3. p. 101.

Found in the mines of *Neusohl* in *Hungary*: it is soluble in 16 times its weight of cold water, and melts with borax into a blue glass: when crystallized it exhibits an elongated 8-sided prism.

*Niccoli.* Green, its watery solution depositing a whitish-green sediment from a mixture of soda.

Vitriol. ferr. et niccol. *Cronst. min.* 123. 2. 4.

Sulphate of nickel. *Schmeisser mineral.* 1. p. 275.

Sulphat of nickel. *Thomson chem.* 3. p. 61.

Found in some mines of *Sweden*, and usually contains some iron: colour a deep green: it crystallizes in double 4-sided pyramids with their tips truncated, and sometimes in large 4-sided equal prisms.

*Zinci.* White, its watery solution depositing a white sediment from a mixture of soda or prussiate of lime, and when evaporated crystallizing into 4-sided prisms terminated at both ends by a pyramid.

Vitriolum album. *Syst. nat.* xii. 3. p. 104. n. 3.

Vitriolum zinci. *Wall syst.* 2. p. 24. n. 3.

White Vitriol. *Berkebe. outl.* p. 253.

Vitriol of zinc. *Kirwan mineral.* 2. p. 23.

Native vitriol of zinc. *Schmeisser mineral.* 1. p. 274.

Sulphat of zinc. *Thomson chem.* 3. p. 66.

Found in the copper mines of *Cornwall* and *Anglesey*, and in the zinc-mines of *Sweden*, *Bohemia*, *Germany*, and *Hungary*; rarely in its perfect native state, but generally in a stalactical or capillary state, or in a loose powdery efflorescence: it is sometimes blended with a little iron, and then tincture of galls turns its solution blackish: the crystals are soluble in something more than twice their weight in water, and efflo-

resce slowly on exposure to the air: specific gravity when crystallized 1,912. when in the state in which it is found in the shops 1,3275. contains acid 40. oxyde 20. water 40. *Berehan*: according to *Kirawan*, acid 20,5. oxyde 40,0. water 39,5.

*Cupri.*

Of a deep blue colour and very astringent acrid taste, its watery solution when copiously mixed with a solution of volatile alkali becoming a fine sky-blue.

Vitriolum cupri. *Syst. nat.* xii. 3. p. 104. n. 2.

Vitriolum cupri. *Wall. syst.* 2. p. 20. n. 1.

Vitriolum veneris. *Amœn acad.* 1. t. 12. f. 4.

Blue vitriol. *Berkenb. outl.* p. 253.

Vitriol of copper. *Kirawan mineral.* 2. p. 22.

Copper vitriol, Blue vitriol. *Schmeissner miner.* 1. p. 272.

Sulphat of copper. *Thomson chem.* 2. p. 579.

2. Light blue, containing iron and copper united with sulphuric acid.

Vitriolum mixtum. *Wall. syst.* 2. p. 26. n. 4. a.

Vitriolum mixtum. *Syst. nat.* xii. 3. p. 105. n. 4.

Vitriol. cupr. et ferr. *Cronst. min.* 123. 2. 1.

3. Deep blue, containing zinc and copper united with sulphuric acid.

*Syst. nat.* xii. 3. p. 105. n. 7.

*Wall. syst. miner.* 2. p. 26. n. 4. d.

Vitriol. cupreo-zinceum. *Cronst.* 123. 2. 4.

4. Light blue, containing iron, zinc and copper united with sulphuric acid.

*Syst. nat.* xii. 3. p. 105. n. 8.

*Wall. syst. miner.* 2. p. 26. n. 4. b.

*Cronst. mineral.* 123. 2. 2.

Mixed vitriol. *Kirawan mineral.* 2. p. 24.

Found in the copper mines of *Wicklow* in *Ireland*, in *France*, *Germany*, *Saxony*, *Hungary*, *Sweden*, &c. sometimes in a state of solution, sometimes crystallized or stalactitical: it has a strong styptic nauseous taste, and is commonly used as a caustic: its crystals are 4-sided prisms with rhomboidal faces which are soluble in four times their weight of cold water, and by exposure to the air they slightly effloresce, lose their lustre, and are covered with a yellowish-grey powder; they likewise communicate a green colour to flame. A valuable article of commerce is produced by placing thin plates of iron in the waters where it is held in solution; for the acid having a greater affinity with iron than copper, gradually decomposes it, and leaves the copper in its place. Specific gravity 2,1943. contains acid 33. oxyde of copper 32. water 35. *Proust.*

*Ferri.* Green, its watery solution depositing an ochraceous sediment when mixed with a solution of soda, and a blue one with prussiate of lime, made blackish by tincture of galls.

Vitriolum martiale. *Syst. nat.* xii. 3. p. 104. n. 1.

Vitriolum ferri. *Wall. syst.* 2. p. 22. n. 2.

Vitriolum martis. *Cronst.* 122. 2. 1. 1. 1.

Green vitriol. *Berkenhout Outl.* p. 255.

Vitriol of iron. *Kirawan mineral.* 2. p. 26.

Martial vitriol. *Schmeißer miner.* 1. p. 272.

Sulphat of iron. *Thomson chem.* 3. p. 8.

Sulphate of iron. *Sowerby Brit. min. t.* 23. 28.

Found in *Britain* and various parts of the continent, in grottos, caverns, and galleries of mines, in the form of pale green crystals, or in a grey or yellowish or reddish-grey efflorescence, or stalactitical or capillary, and most commonly mixed with copper zinc or alum; it is also found in solution: when pure it crystallizes into rhomboidal green transparent prisms which are insoluble in alcohol: when heated it melts, gradually loses its water of crystallization, and with a strong heat there remains a red powder formerly known by the name of *colcothar* of *vitriol*: specific gravity 1,8399. contains acid 39. oxyde 23. water 38. *Bergman.*

*terreum.* Combined with earth, its watery solution made blackish by a mixture of tincture of galls.

Vitriol. terra mineralis. *Wall. syst.* 2. p. 26.

Found in *Italy* and *Hungary*, of a yellow, red, blue, green, or black colour: the earth with which it is mixed is generally argillaceous.

*Atramentarium.* Mixed with stones which are not shistose, its watery solution made black by a mixture of tincture of galls.

Vitriol. mineralis. lap. *Syst. nat.* xii. 3. p. 106. n. 8.

Vitriol. lap. mineralis. *Wall. syst.* 2. p. 27. n. 6.

1. Of a red colour. *Calcitis.*

2. Of a grey colour. *Sory.*

3. Of a black colour. *Melanteria.*

4. Of a yellow colour. *Misy.*

Found on mount *Rammelsburg* in *Hercynia*, and is produced by pyrites which have mouldered in the air.

*Schisti.* Mixed with shist, its watery solution made black by a mixture of tincture of galls.

Found in *Franconia*, and originates in decayed pyrites.

*Turfæ.* Mixed with turf, its watery solution made blackish by a mixture of tincture of galls.

*Cronst. mineral. sect. 282. 2. 2. 1.*

Found in some bogs in *Sweden*, *Saxony*, *Prussia*, and *France*: it never burns with a flame.

## CLASS III. INFLAMMABLES.

73. TURFA. Consisting of vegetable fibres interwoven together and penetrated with bitumen.
74. BITUMEN. Giving out a faint disagreeable smell when burnt.
75. MELLITES. Of a honey-yellow colour, in the form of small 8-sided crystals.
76. SUCCINUM. Melting with difficulty, and emitting an agreeable smell during ignition, becoming electric by friction or heat.
77. AMBRA. Softening and melting like wax in a gentle heat, and emitting a strong agreeable smell when warm, not becoming electric.
78. GRAPHITES. Burning with difficulty, but mixed with soda emitting reddish flames and sparks, staining the fingers black.
79. SULPHUR. Burning with pale blue flames, and emitting during combustion strong suffocating peculiar fumes.

## INFLAMMABLES.

73. TURFA. Generally of a dull colour, and more or less fibrous texture: when burnt emitting fumes which are exceedingly offensive to the smell and the eyes: consisting of the fibrous roots and other parts of vegetables more or less intermixed, and combined with bitumen.

*cæspitosa.* Whitish, light, easily and speedily burning into ashes with flame and a small degree of fumes.

Turf. *Kirwan mineral.* 2. p. 62.

Turf. *Schmeisser mineral.* 1. p. 296.

1. Consisting principally of heath.
2. Consisting chiefly of mosses and grasses.

Found commonly on moors and heaths, covering the surface of the ground, or covered with a light stratum of the soil only, and is generally in deeper layers than others of its kind: it is composed of the radicles of heath and mosses which have undergone very little alteration, and is pale, hoary, or when contaminated with iron ochraceous: it is so light that a piece 14 inches long, 6 broad, and 4 thick, will weigh only from 13 to 15 ounces: its vapour is not so disagreeable to the nose and eyes as many others, but it consumes very quick, gives but little heat, and leaves a large quantity of ashes.

*foliata.* Of a texture approaching to the lamellar.

*Cronst. miner. sect.* 291. 5. 2. 1. 2.

Found in bogs and spongy places, collected into small hillocks, and consists of numerous unequal layers which are separable like the leaves of a book: the vegetables of which it is composed are in a rather more decayed state than those of the last.

*maritima.* Burning slowly, and emitting most offensive fumes to the nose and eyes.

Darry. *Wall. syst. miner.* 1. p. 20. n. 6. b.

Found in low maritime situations and in the neighbourhood of salt springs, rather ponderous, of a darkish colour, and takes a longer time in consuming than T. *cæspitosa*, and gives out much more heat.

*palustris.* Of a dark colour, consolidating in the air, burning quicker and with less offensive fumes.

*Humus vegetabilis.* *Syst. nat.* xii. 3. p. 210. n. 6.

*Humus combustibilis.* *Wall. syst.* 1. p. 21. n. 7.

*Peat.* *Kirwan mineral.* 2. p. 62.

Found every where in bogs and morasses, and is generally the middle and lower beds under turf, and frequently at the bottom of bogs where the water has lain stagnant: the vegetable substances are in quite a decayed state, and therefore less visible: a brick of 14 inches long, 6 broad, and 4 thick, will weigh from a pound and a quarter to a pound and three quarters: it is, in many places, a principal article of fuel, and its ashes are of considerable value as a manure.

*picea.* Of a dark colour, consolidating in the air, a little greasy to the touch, impregnated with a large proportion of bitumen, and burning with much heat and fumes.

*Turfa solida.* *Cronst. min.* 284. 2. 1. 1.

Found on plains at the tops of higher mountains, frequently on those composed of granite, and at the bottom of stagnant waters: after being sometime kept it will burn like coal: it is the most ponderous of its kind, a brick 14 inches long, 6 broad, and 4 thick, weighing about two pounds.

74. BITUMEN. Easily combustible with flame, and emitting when ignited a strong odour, greasy to the touch.

*Naphtha.* Fluid, whitish, volatile, highly inflammable.

*Bitumen fluidum.* *Syst. nat.* xii. 3. p. 109. n. 1.

*Bitumen fluidissimum.* *Wall. syst.* 2. p. 89. n. 1.

*Oleum montanum.* *Wolderid. min.* 24.

*Naphtha.* *Kirwan mineral.* 2. p. 42.

*Naphtha.* *Schmeissner miner.* 1. p. 285.

*Naphtha.* *Thomson chem.* 4. p. 8.

Found principally in *Persia* and *Media*, where it oozes like water out of sand-stones, is fluid and transparent, swims on alcohol and is insoluble in it, catches fire on the approach of flame, burns with a white flame and leaves hardly any residuum: it is so volatile, that in warm weather it fills the atmosphere around it with its odour: has somewhat of a sharp taste, and is not miscible with water: after exposure to the air, it becomes yellow, and afterwards brown; its consistence is increased, and at last it passes into petroleum: specific gravity when white 729. when yellow 847.

*Petroleum.* Liquid, but of a thicker consistence than the last and not so transparent, coloured.

Bitumen liquidiusc. *Syst. nat.* xii. 3. p. 109. n. 2.

Bitumen crassius. *Wall. syst.* 2. p. 90.

Oleum montan, luteum. *Woltersd. min.* 24.

Petroleum. *Cronst. min. sect.* 147. 2.

Rock oil. *Berkenhout outl.* p. 257.

Rock oil. *Schmeisser mineral.* 1. p. 286.

Petrol. *Kirwan mineral.* 2. p. 47.

Petroleum. *Thomson chem.* 4. p. 9.

Found on the surface of certain springs in *Persia*, *Media*, and *Siberia*, or in coal-mines or oozing out of rocks and mineral beds in various parts of *Great-Britain* and *Europe* in general: it is of a thicker consistence than naphtha and a rather less pleasant smell, is lighter than water, but heavier than alcohol: colour yellow, or with a shade of red or green, or brownish or blackish: when burnt it yields a soot, and leaves a small quantity of coaly residuum: specific gravity 8783. By exposure it becomes of the consistence of treacle.

*Maltha*, Impiffated, black, sticking to the fingers.

Bitumen tenax. *Syst. nat.* xii. 3. p. 110. n. 3.

Bitumen crassum. *Wall. syst.* 2. p. 92. n. 3.

Oleum montan, tenax. *Woltersd. min.* 24.

Petroleum tenax. *Cronst. miner. sect.* 148.

Mineral Tar, Barbadoes Tar. *Kirwan* 2. p. 46.

Tar. *Schmeisser miner.* 1. p. 287.

Mineral Tar. *Thomson chem.* 4. p. 9.

Found in *Colebrook dale* and other coal counties in *Britain*, sometimes floating on lakes in *Palestine*, *Babylon*, *Arabia*, *Persia*, *China*, *Barbadoes*, and various parts of *Europe*, and frequently issuing from rocks: is of the consistence of treacle, of a blackish-brown colour, opaque, and has a very strong smell when burnt: it seems to have its origin from the former species, which by long exposure to the air, has lost its volatile particles, and obtained a thicker consistence: specific gravity 1,1.

*Mumia*, Black, inodorous, softening in a low heat.

Bitumen subfriabile. *Syst. nat.* xii. 3. p. 110. n. 4.

Mumia mineralis. *Hasselt. it.* 537.

Mumia nativa. *Kämpf. amæn. exot. fasc.* 2. p. 430.

Maltha. *Kirwan mineral.* 2. p. 44.

Mineral Mummy. *Schmeisser min.* 1. p. 291.

Mineral pitch. *Thomson chem.* 4. p. 10.

Found in *Persia*, in the cliffs of rocks at *Chorassou*, on the river *Caucasus*, and is said to have been discovered in *Lancashire*: colour blackish-brown, soft and tough like cobbler's wax when the weather is warm, but brittle like pitch in cold weather:



it does not stain the fingers, and on a hot iron flames with a rather strong odour and leaves a quantity of ashes: specific gravity from 1,45. to 2,07. The Persians value it highly, and after mixing it with about a third part of wax apply it to fresh wounds.

*Asphaltum.*

Opaque, shining, black or brownish-black, easily melting in heat, effervescing with concentrated nitric acid.

Bitumen friabile. *Syst. nat.* xii. 3. p. 110. n. 5.

Bitumen solidum. *Wall. jyst.* 2. p. 93. n. 4.

Pix montana. *Wolterjrd. min.* 25.

Petroleum induratum. *Cronst. min.* 149. 3. 1.

Asphalt. *Kirwan mineral* 2. p. 46.

Bitumen. *Schmeisser mineral.* 1. p. 288.

Asphalt. *Thomson chem.* 4. p. 10.

Found abundantly in various parts of *Europe, Asia, and America*, especially in the island *Trinidad* in a plain called *Turlane*, where it covers the surface of the earth for a considerable distance: its surface is hard, black, shining, and resinous: it easily melts before the flame of a candle, and may be used for the same purposes as sealing-wax: when pure it burns without leaving any ashes: when hardened is very brittle, and was used by the ancient Egyptians for making mummies: when dissolved in oil it is used as a varnish for leather: and other purposes: specific gravity 1,07.

*sevum.*

White, rather brittle, floating on water, burning easily with a blue flame.

Sevum minerale. *Ad. Stockh. art.* 5. 1. 2.

Mineral tallow. *Kirwan mineral.* 2. p. 47.

Found in the maritime parts of *Finland* in the neighbourhood of *Narko*, and at the lake *Loja*: it is soluble in cold olive oil, and in alcohol if mixed with a little alkali: is of the consistence of tallow, lighter than ambergris, and burns quickly leaving a considerable residuum of ashes.

*elasticum.*

Brown, solid, elastic like indian rubber.

Mineral Cahoutchou. *Kirwan mineral.* 2. p. 48.

Elastic bitumen. *Schmeisser mineral.* 1. p. 290.

Mineral Cahoutchouc. *Thomson chem.* 4. p. 11.

Found in the lead-mine of *Odin*, near *Castletown* in *Derbyshire* with calcareous spar: colour yellowish or reddish-brown, sometimes paler and resembling in colour and texture fine cork: is very elastic, and soft enough to be compressed with the fingers when fresh, but hardens and gets rather brittle by long exposure to the atmosphere: is insoluble in ether, alcohol, and oil of turpentine, but is readily dissolved in oil of olives: burns with a bright flame, and when distilled yields bituminous oil insoluble in water, leaving a carbonaceous residuum: specific gravity 0,9053. to 1,0233.

*Gagas.* Compact, deep black, opaque, of a conchoidal texture shining internally, burning with a greenish flame.

Bitumeu. solid. natans. *Syst. nat.* xii. 3. p. 111. n. 8.

Bitumen durissimum. *Wall. syst.* 2. p. 106. n. 7.

*Gagas.* *Vogel. min.* 327. *Baum. min.* 1. p. 34.

*Gagat.* *Schmeisser miner.* 1. p. 289.

*Jet.* *Kirwan* 2. p. 64. *Thomson chem.* 4. p. 12.

*Jet.* *Sowerby Brit. min.* 1. 51. *Brand. foss. fig.* 121.

Found in various parts of *Great-Britain, France, Spain, Germany,* &c. particularly on the coast of *Lowestoft in Suffolk*, with impressions of *Cornu Ammonis*, sometimes in layers, but generally in kidney-form masses of various sizes: colour full glossy black, glassy internally: texture striated, and conchoidal: when cold has no odour, but when heated emits an odour resembling that of asphalt: readily inflames and loses during combustion 14 grains in 20, leaving an earthy residuum: in thin pieces will float for a short time on the water: specific gravity 1,259. It is formed into buttons, beads, and other trinkets: when heated or rubbed hard will attract light bodies.

*Ampelites.* Black, opaque, brittle, does not stain the fingers, burns with a bright white flame like a candle.

Bitumen humi. *Syst. nat.* xii. 3. p. 110. n. 6?

Bitumen terra mineralis. *Wall. syst.* 2. p. 96. n. 5.

Bituminous wood, Bovey coal. *Schmeisser* 1. p. 295.

Cannel coal, Bovey coal. *Kirwan* 2. p. 52.

Cannel coal. *Thomson chem.* 4. p. 12.

1. Earthy internally.

2. Compact and glossy throughout.

Found in *Lancashire, Ireland*, and many parts of *Europe*, of a compact flaty texture and conchoidal fracture: it kindles easily and leaves a stony or sooty residuum of a grey colour: it is susceptible of a fine polish, and like jet may be made into trinkets: specific gravity 1,232. to 1,426.

*Lithan-  
strax.*

Opaque, black, brittle, burning with a blackish or grey smoke and leaving black or grey ashes and cinders.

Bitumen sifiosum. *Syst. nat.* xii. 3. p. 111. n. 7.

Bitumen lapideum. *Wall. syst.* 2. p. 98. n. 6.

Coal. *Kirwan miner.* 2. p. 53. *Schmeisser* 1. p. 292.

Common coal. *Thomson chem.* 4. p. 14.

Pit coal. *Sowerby Brit. min. tab.* 48, 49.

1. Of a flaty texture.

2. Of a rather conchoidal texture.

3. Highly impregnated with ferruginous clay and sulphur, emitting sulphurous fumes while burning, and leaving a great quantity of ferruginous ashes and cinders.
4. Crystallized in cubes or 6-sided prisms.

Found in most parts of the globe, most commonly under limestone, sandstone, or shistose clay, forming vast beds and veins in secondary mountains, or plains composed of the same materials; frequently in mountains containing lava and columnar basalts: colour black, more or less perfect: stains the fingers: burns rather slowly, cakes more or less during combustion, and does not explode and fly out: sometimes withers and falls to pieces when exposed to the air, losing a portion of its bitumen: specific gravity from 1,25. to 1,27.

oxygena-  
tum.

Opake, black, very brittle, not staining the fingers, burning with little or no smoke or flame, or flaming with iridescent colours, leaving a very small quantity of whitish ashes.

Mineral carbon. *Kirwan. miner. 2. p. 53.*

Kilkenny coal. *Thomson chem. 4. p. 15.*

Oxygenated carbon. *Sowerby Brit. min. tab. 50.*

1. Of a slaty texture and conchoidal fracture, with a glassy internal lustre. *Stone coal.*
2. Of a fibrous texture and rather conchoidal fracture, with less internal lustre, and often intermixed with powdered carbon. *Culm.*

Found in various parts of *Wales*, particularly round *Swansea*, and in *Ireland*, in strata and veins like the former: it burns very slowly, with great heat, without flame or with purple, yellow and white iridescent colours, and is ignited with much difficulty: during combustion it emits faint suffocating vapours like charcoal, and is therefore dangerous to use in small close rooms: while burning it explodes and flies about: the culm is considerably contaminated with powdered carbon which may be easily rubbed off, and then it does not stain the fingers: it contains near 80 per cent. of pure carbon. The stone coal is principally used for malting, and the culm for burning lime.

75. MELLITES. Soft, brittle, pellucid, shining with a glassy lustre, of a conchoidal texture and honey-yellow colour: in the form of a double 4-sided pyramid with the faces quite smooth.

*Weneri.* MELLITES.

*Karsten Leske mineral.* 1. p. 334.

*Abich Crell's annals.* 1797. 2. p. 3.

*Vauquelin annal. de chim.* 36. p. 23.

Mellelite. *Kirwan miner.* 2. p. 68.

Honey stone. *Schmeisser mineral.* 1. p. 299.

Mellite, Mullat of Alumina. *Thomson chem.* 3. p. 628.

Found near *Artun* in *Saxony*, between the layers of wood-coal, and in *Savitzzerland* imbedded in asphalt, in colour, texture and transparency resembling the honey-yellow amber, from which it principally differs in crystallizing in small double 4-sided pyramids whose angles are often truncated: when heated it whitens, and burns in the open air without odour, and without being sensibly charred, leaving a white residuum which at first has no taste, but at length leaves an acid impression on the tongue: fracture conchoidal or indeterminate: specific gravity 1,666.

76. SUCCINUM. Lightish, yellow, generally transparent, shining internally, of a conchoidal fracture, tough and brittle, when rubbed or heated fragrant and strongly attracting straws and light bodies: yielding by distillation succinic acid.

*electricum.* SUCCINUM.

*Electrum diaphanum.* *Syst. nat.* 1. p. 167. n. 2,

*Succinum durius.* *Wall. syst.* 2. p. 108.

Amber. *Kirwan* 2. p. 65. *Schmeisser* 1. p. 298.

Amber. *Berkenhout outl.* p. 256.

Common amber, *Thomson chem.* 4. p. 16.

Found in *Great-Britain*, principally on the *Suffolk* coast, and in various parts of *Europe*, either on the sea shores or at a considerable distance under ground: colour honey-yellow, paler or deeper, sometimes verging to ochraceous, greenish, brownish, blackish or reddish; more or less transparent, and often marked with clouds or specks, and inclosing insects and other light bodies: it is never found crystallized, but is brittle and can easily be reduced to powder: it is highly electric, and if a piece be kindled it burns to the end with pungent white vapours and without melting: it takes a good polish, and is made into beads, necklaces and other ornaments: specific gravity from 1,078. to 1,085.

77. AMBRA. Floating on water, without lustre, opaque, of a granular texture, soft like wax, and sticking to the teeth: highly fragrant, without particular taste, melting in the heat of boiling water, burning easily with a white flame and grey smoke and entirely consuming.

*maritima.* AMBRA.

Ambra grisea. *Cronst. min. sect.* 144.

Ambergrise. *Swediaur Philos. Transf. vol.* 73. *art.* 15.

Ambergris. *Kirwan mineral.* 2. *p.* 66.

Ambra. *Schmeisser mineral.* 1. *p.* 297.

1. Of a grey colour, a little variegated,  
 Ambra grisea. *Syst. nat.* xii. 3. *p.* 107. *n.* 1.  
 Ambra grisea. *Rumph. mus.* 262. *t.* 53, 54.  
 Ambra variegata. *Wall. syst.* 2. *p.* 118.  
 Bitumen suaveolens. *Cartheuf. min.* 49.

2. Of uniform blackish-brown colour.  
 Ambra unicolor. *Syst. nat.* xii. 3. *p.* 107. *n.* 2.  
 Ambra unicolor. *Wall. syst.* 2. *p.* 119. *n.* 2.

Found chiefly on the shores of the *Molucca islands*, *Sumatra*, *Madagascar*, *Ethiopia*, and *Malabar*: colour various shades of grey, yellowish, brownish and blackish, with often dots, veins, spots and lines of various colours: it breaks easily but cannot be reduced to powder: it melts like wax, and if chewed sticks to the teeth like mastick: it is somewhat soluble in spirits of wine with the assistance of heat: specific gravity 0.926. From the observations and conclusions of Dr. Swediaur, it appears beyond doubt, that this substance is nothing more than the excrements of the *Phyfeter macrocephalus* or *Spermaceti Whale*, as it is very frequently met with in its intestines, and most commonly mixed with the beaks of the *Sepia octopoda*, which this whale is known to feed upon. He observes likewise, that when taken out of the fish's abdomen it is more impure, and has an unpleasant odour resembling the other fæces of the animal, but that by exposure to the air it becomes purer, of a lighter colour, more compact, and gradually changes its odour to a grateful ambrosiacal smell. It is principally used as a perfume.

78. GRAPHITES. Consisting principally of carbon, with a little iron and generally a little silica or alumina; when pure burns with a reddish flame, emitting beautiful sparks and a smell of sulphur, and leaving little residuum: black, opaque, very soft, feels somewhat greasy and stains the fingers, brittle, breaking into indeterminate fragments.

*Plumbago.* Of a metallic lustre, and flaty structure.

Molybdænum subquamos. *Syst. nat.* xii. 3. p. 121. n. 1. a, b.

Ferrum corrosum. *Wall syst.* 2. p. 249. n. 14.

Plumbago. *Scheele Aët. Stockh.* 1779. p. 238.

Plumbago. *Kirwan miner.* 2. p. 66.

Black lead. *Schmiffner mineral.* 1. p. 301.

Plumbago. *Thomson chem* 4. p. 16.

Found in different parts of *Great-Britain*, particularly near *Dumfries* in *Scotland*, at *Barrowdale*, and *Keswick* in *Cumberland*; in *Greenland* and various parts of the continent: colour blackish or iron-grey, blueish-grey when cut, with a slight metallic lustre: yields to the impression of the nail, and makes a black mark on paper: texture compact, with a fine grain, and rather a little flexible: it is chiefly used for making black-lead pencils, for blackening stoves, and when mixed with a proper proportion of silica for crucibles: specific gravity from 1,987. to 2,089. contains when pure, carbon 90, iron 10. *Scheele.*

*Carbo.* Of a chonchoidal structure, breaking into indeterminate fragments.

*Wiedenm. Berg. Journ.* 1789. 1. p. 609.

*Klaproth chem. annal.* 1790. 1. p. 293.

Found near *Schemnitz* in *Hungary*, imbedded in thin strata or veins of black indurated alumina, near *Tokarveniza* running through a matrix of opal like a vein, in *France* and *Norway*: when exposed to a white heat loses all its carbon which is 90 per cent. leaving a residuum of nearly equal parts of alumina and oxide of iron.

*Fuligo.* Deep black internally, making a deep black mark.

*Habel. Schreb. berl. naturf.* 10. p. 75.

Found near *Dutweiler* in *Nassovia*, alternating in thin strata with coals. It is probable that these three species might with much propriety be reduced to one.

79. **SULPHUR.** Yellow with a shade of green, hard, brittle, becoming electric by friction, insoluble in water: melting and becoming liquid in a low heat, burning with a blue flame and intollerably suffocating vapours which discharge most vegetable colours, in a higher and continued heat evaporating in the form of vapours: combining with most metals.

*nativum.* Pure, in an uncombined state.

Pyrites nudus. *Syst. nat.* xii. 3. p. 113. n. 1.

Sulphur nativum. *Wall. syst.* 2. p. 123. n. 1.

Brimstone. *Schmeisser* 1. p. 301. *Kirwan* 2. p. 69.

Native sulphur. *Thomson chem.* 1. p. 31. 4. p. 6.

1. In a state of powder, or flowers.

Sulphur pulverulentum. *Wall. syst.* 2. p. 125. n. 1. c.

2. Solid and pure.

Of a common form and opaque. *Wall. syst.* 2. p. 124. n. 1. c.

Of a common form and diaphanous. *Wall. syst.* n. 1. b.

Fibrous or capillary. *Wall. syst.* n. 1. d.

In the form of crystals. *Wall. syst.* n. 1. a.

3. Solid and mixed with arsenic or other materials, of a reddish colour.

Sulphur arsenicale. *Wall. syst.* 2. p. 125. n. 2.

Found in a state of solution in the numerous sulphur waters of Europe, and sometimes deposited in a state of powder in the drains through which they run; in a solid state in the mines of Sicily and Naples, &c. contaminated with arsenic in the neighbourhood of volcanoes, and crystallized in tables, cubes, 4 sided prisms longitudinally and very finely striate, simple 3 or 6-sided pyramids, or most commonly in double 4-sided pyramids, in Italy, Spain, Normandy, and Siberia: it is generally found in small pieces of gypsum, layers of clay, or in lime: lustre a little greasy, and causes double refraction: it does not dissolve in water, but is soluble in fat oils and alkalies: specific gravity 1,990. consists entirely of sulphuric acid and oxygen.

*terreum.*

- Combined with mould or alumina which is left behind after deflagration, not producing a disagreeable smell when acids are poured on it.

Sulphur coloratum. *Wall. syst.* 2. p. 125. n. 3.

*Kirwan mineral.* 2. p. 73.

Coal blende. *Schmeisser miner.* 1. p. 303.



Found frequently in the neighbourhood of volcanoes; especially where animal recrements have lain deposited for a long time, and also in other parts, as in some lakes of *Spain* and *Germany*: colour grey or yellow, or if combined with bituminous earths brown, blackish or black: it burns slowly with a bluish flame, leaving a residuum in proportion to the earthy matter with which it is mixed.

*hepaticum.* Combined with lime or potash which it leaves behind after deflagration, smelling like rotten eggs either spontaneously or when acids are poured on it.

Hepar of sulphur. *Schmeisser miner.* 1. p. 303.

Liver of sulphur. *Kirwan miner.* 2. p. 83.

Sulphuret of potash. *Thomson chem.* 1. p. 470.

Found in a state of solution in all sulphur waters, and is easily detected by its disagreeable smell and taste, and by its readily tarnishing silver and becoming milky with acids and black with acetite of lead; it is also, though rarely, found in a state of powder at the bottom of lakes: colour brown, not unlike the liver of animals, but becoming green and even white when exposed to the air: its taste is acid, caustic, and bitter, and it leaves a brown stain on the skin; it converts vegetable blues to green and soon destroys them: when exposed to a violent heat, the sulphur sublims, and leaves behind the potash or soda in a pure state.

*Pyrites.* Intimately combined with iron, with a metallic splendour, of a straw-yellow colour and common form.

Pyrites amorphus. *Syst. nat.* xii. 3. p. 115. n. 5.

Sulphur informe. *Wall. syst.* 2. p. 226. n. 4.

Sulphur mundic. *Berkenb. outl.* p. 258.

Sulphur pyrites, Sulphureous mundic. *Schmeiss.* 2. p. 111.

Pyrites. *Kirwan mineral.* 2. p. 75, 76.

Sulphat of iron. *Thomson chem.* 4. p. 51.

Found in every part of the globe, occurring in almost every rock and vein, or forming masses or veins of itself: hard, frequently mouldering and losing its metallic splendour, opaque, brittle, melting with difficulty, and sometimes attracted by the magnet: frequently containing copper, arsenic, or alumina; breaking into indeterminate fragments, of a somewhat radiated texture or compact, with a polished reflecting surface and gradually passing into the crystallized state: not soluble in muriatic acid, but decomposing when in contact with air and moisture and producing heat and sulphuric acid: like the two following species, strikes fire with steel: it consists of iron ore mineralized by sulphur: specific gravity from 3,440. to 4,789.

- figuratum.* Intimately combined with iron, with a metallic splendour, of a gold-yellow colour and more or less rounded form.  
 Pyrites figuratus. *Syst. nat.* xii. 3. p. 114. n. 4.  
 Sulphur globulos. concret. *Wall. syst.* 2. p. 129. n. 5.  
 Sulphureus mundic. *Schmeisser miner.* 2. p. 111.  
 Pyrites. *Kirwan mineral.* 2. p. 75, 76.  
 Sulphuret of iron. *Thomson chem.* 4. p. 51.  
 Sulphuret of iron. *Sowerby Brit. min.* t. 104.  
 Found very commonly in mines and argillaceous marl, of a more or less globular form, or hemispherical, ovate, kidney-form, stactitical, and assuming various fanciful representations, as cones, fruit, mushrooms, shrubs, &c.
- Marcasita* Intimately combined with iron, with a metallic splendour, of a gold-yellow colour, in the form of crystals.  
 Pyrites crystallinus. *Syst. nat.* xii. 3. p. 113. n. 3.  
 Sulphur forma crystallina. *Wall. syst.* 2. p. 131. n. 6.  
 Pyrites. *Kirwan mineral.* 2. p. 76.  
 Sulphur pyrites. *Schmeisser mineral.* 2. p. 111.  
 Sulphuret of iron. *Thomson chem.* 4. p. 51.  
 Sulphuret of iron. *Sowerby Brit. min.* t. 105.
1. Pyramidal, with the pyramid 3-sided.  
 The pyramid perfect,  
 The pyramid with the margins truncate.  
*Gmel. syst. nat.* 3. p. 447. t. 1. f. 37.
  2. Crystallized in cubes.  
*Sowerby Brit. min.* 1. tab. 29, 30.  
*Gmel. syst. nat.* 3. p. 446. tab. 1. f. 19:  
 With the faces convex.  
 With the faces flat.  
 With the faces smooth:  
 With the faces striate.  
 With the lines on all the faces in the same direction.  
 With the lines on the faces alternately longitudinal & transverse.
  3. Crystallized in capillary prisms, which are more frequently disposed in a stellate than a parallel manner.  
 The prisms 6-sided.  
 The prisms 8-sided:  
 The prisms 12-sided and perfect.  
*Gmel. syst. nat.* 3. p. 447. t. 1. f. 29; 30. *Mus. Test. t.* 12. f. 3.  
 The prisms 12-sided, with some of the angles truncate.  
*Gmel. syst. nat.* 3. p. 446: t. 1. f. 21.  
 The prisms 12-sided, with most of the angles truncate.  
*Gmel. syst. nat.* 3. tab. 1. f. 18; 35.  
 Found very commonly among coals and shistose rocks, and in mines: it was formerly cut and polished by lapidaries, and shaped into buttons and other ornaments: specific gravity from 4, 1006. to 4,7491. *Sowerby.*

## CLASS IV. METALS.

*A. Malleable.*

80. PLATINUM. Silvery-white; very hard and tenacious; sonorous; exceedingly malleable and ductile; not melting in a white heat; soluble only in 16 times its weight of boiling nitro-muriatic acid, and giving first a yellow and then a deeper red or brown colour to the solution: specific gravity 23,000.
81. AURUM. Reddish-yellow; hardish and tenacious; not sonorous; exceedingly malleable and ductile; melting in a white heat; soluble only in nitro-muriatic acid, and giving the solution a yellow colour: specific gravity 19,300.
82. ARGENTUM. Silvery-white; hard and tenacious; sonorous; exceedingly malleable and ductile; melting in a white heat; soluble in nitric acid, and imparting no colour to the solution: specific gravity 10,500.
83. HYDRAGYRUM. Silvery-white; fluid at the common temperature of the atmosphere; malleable when rendered solid by a sufficient degree of cold; evaporating in heat; soluble in mineral acids, and imparting no colour to the solution: specific gravity 13,568.
84. CUPRUM. Fine red; hard and tenacious; sonorous; malleable and ductile; when exposed to a red heat taking fire and emitting a most brilliant lively green light; exploding violently when melted and cast into water: specific gravity 8,667.

85. **FERRUM.** Blueish-grey; very hard, tenacious, and elastic; exceedingly malleable; ductile; attracted by the magnet; melting in a white heat; soluble in all acids, and giving the solution a black colour when vegetable astringents are added to it: specific gravity 7,788.
86. **STANNUM.** Silvery-white; softish; very malleable and ductile; not sonorous; flexible, and crackling when bent; melting easily; soluble in all acids, and giving the solution a bitter taste: specific gravity 7,299.
87. **PLUMBUM.** Blueish-white; soft; not sonorous; very malleable, and a little ductile and tenacious; easily melting, and during liquefaction exhibiting iridescent colours on the surface; soluble in all acids, and giving the solution a sweetish taste: specific gravity 11,352.
88. **NICCOLUM.** Reddish-white; hard; malleable; assuming a green colour when heated, and acquiring a purple tinge if the heat be continued; attracted by the magnet; soluble in all acids, and giving the solution a green colour: specific gravity 9,000.
89. **ZINCUM.** Brilliant white with a shade of blue; hardish; a little malleable, but not ductile; slightly sonorous; of a fibrous or scaly texture; taking fire when heated to a strong degree, burning with a brilliant white flame and emitting light white flakes; soluble in all acids, and imparting no colour to the solution: specific gravity 7,190.

*B. Brittle.*

90. **BISMUTUM.** Reddish-white, soft, brittle, of a lamellar texture; easily melting; taking fire when heated to a strong red degree, burning with a faint blue flame and emitting a yellow smoke; depositing a white precipitate if its solution in nitric acid be diluted with water: specific gravity 9,822.

## 91. STIBIUM.

Greyish-white; very brittle; of a lamellar and radiated texture; melting in a red heat, and becoming first a greyish-white oxyde, afterwards an hyacinthine glass, and at last evaporating in a white vapour; depositing a white precipitate if its solution in muriatic acid be diluted with water: specific gravity 6,702.

## 92. TELLURIUM.

Blueish-white; very brittle; of a laminar texture; easily melting, and boiling and evaporating if the heat be increased; burning before the blowpipe with a lively blue flame the edges of which are green, and at last evaporating in a white smoke; depositing a white precipitate if its solution in nitro-muriatic acid be largely diluted with water: specific gravity 6,115.

## 93. ARSENICUM.

Blueish-white; extremely brittle; subliming in a white powder in a moderate heat without melting, & emitting a strong smell resembling garlic; its sublimed powder giving its solution in water an acid taste, and turning vegetable blues red: specific gravity 8,310.

## 94. COBALTUM.

Blueish-grey with often a shade of red, hardish, very brittle; melting with difficulty, burning in a violent heat with a red flame; attracted by the magnet; giving a red colour to its solution in nitric acid, and precipitating a blue powder with the addition of potash: specific gravity 8,150.

## 95. MAGNESIUM.

Iron-grey or brown, opaque, hard, very brittle, melting with great difficulty; attracted by the magnet when reduced to powder; mixed with nitre and exposed a sufficient time to heat, the mixture when thrown into water exhibiting a green, then a purple, then a scarlet colour, all which at last disappear: specific gravity 7,000.

## 96. TUNGSTENUM.

Brownish-red, internally blueish, brittle, extremely hard; not attracted by the magnet; melting with great difficulty, when heated is gradually converted from a black to a yellow oxyde, which assumes a blue colour with the muriatic acid: specific gravity 17,600.

97. **MOLYBDÆNUM.** Iron-grey, brittle, composed of scaly particles; melting with great difficulty, gradually becoming a white volatile oxyde when heated, which with the addition of borax is reducible to a violet glass: specific gravity 7,500.
98. **URANIUM.** Dark-grey inclining internally to brown, soft, opaque, melting with extreme difficulty; convertible into a yellow powder by means of the nitric acid: specific gravity 6,440.
99. **TITANIUM.** Orange red, very hard, in minute agglutinated grains; not fusible by any known heat, forming a blue or purple oxyde when heated: specific gravity —.
100. **CHROMIUM.** White with a shade of yellow, very brittle; melting with difficulty, dissolving slowly in acids; gradually becoming a green oxyde when heated in a close vessel: specific gravity —.
101. **COLUMBIUM.** Dark brown-grey, hardish, very brittle, of an imperfectly lamellar texture; yielding when pounded a dark chocolate-brown powder which is not attracted by the magnet; yielding a black powdery oxyde when exposed to a very violent heat: specific gravity 5,918.
102. **TANTALIUM.** Blackish-grey, softish, of a granular fracture, not soluble in any acid, nor altering its colour when heated to redness; yielding a white powdery oxyde: specific gravity 5,130.

## METALS.

80. PLATINUM. Of a silvery colour not tarnished by the air, very hard and tenacious, sonorous, exceedingly malleable and ductile, specific gravity 23,000: not fusible in any degree of heat, but detonating with nitre: soluble only by boiling it in 16 times its weight of nitro-muriatic acid, and giving the solution first a yellow and then a red-brown colour; its oxyde precipitated from this solution by the addition of muriate of ammonia in the form of an orange powder.

*granulatum* PLATINUM.

Platina. *Wall. syst. min.* 2. p. 365. n. 7.

Platina. *Watson Philos Transact.* 46. n. 496.

Platina. *Kirwan miner.* 2. p. 103. *Schmeisser min.* 2. p. 17.

Platinum. *Thomson chem.* 1. p. 112. & 4. p. 21.

Found near *Quito* in *Peru*, near *Santa Fé* in *New Granada*, and near the village *Choco*, in mines or mixed with sand on the banks of rivers, always in the form of small smooth compressed grains of the colour of polished tin: it is always combined with iron, sometimes amounting to an eighth part, which may be readily separated from it by dissolving it in muriatic acid: it is the heaviest and most refractory of all metals, and requires a very vehement degree of heat to render it liquid: its tenacity is such, that a wire 0,078 of an inch in diameter is capable of supporting a weight of 27,431 pounds avoirdupois without breaking: it is easily melted by a flux of powdered glass, borax, and charcoal: it is frequently magnetic from the quantity of iron it contains. In consequence of its great malleability, tenacity, durability, and insolubility, it is a very precious metal.

81. AURUM. Of a reddish-yellow colour not tarnished by the air, softish and very tenacious, not sonorous, exceedingly malleable and ductile, specific gravity 19,300: burning in a red heat with a sea-green light, and melting at a white heat: soluble only in nitro-muriatic acid and giving the solution a yellow colour: when melted with borax producing a ruby-coloured glass.

*Gold.*

*nativum.*

Not combined with other minerals, very ponderous, ductile, visible in its matrix.

Aurum nudum *Syst. nat.* xii. 3. p. 151. n. 1.

Aurum nativum, *Wall. Syst.* 2. p. 355. n. 1.

Native gold. *Philos. Transf.* 1796. p. 45.

Native gold. *Kirawan miner.* 2. p. 93. *Schmeisser* 2. p. 23.

Native gold. *Thomson chem.* 4. p. 21.

Native gold. *Sowerby Brit. min.* 1. p. 111. t. 52.

Found in the sand of a stream flowing from mount *Grogan* near *Arklow* in the county of *Wicklow* in *Ireland*, in *Cornwall* and *Scotland*, in the mines of *Peru* and *Chili*, *New Spain*, *Java*, *Siberia*, *Transylvania*, *Spain*, *Hungary*, *France*, and most countries of *Europe*, generally near the surface or mixed with sand in the beds of rivers: it is rarely found quite pure, but almost always mixed with silver, copper, or other substances, giving more or less variation to its appearance or colour: its form is generally common, or imbedded in its matrix in various shapes; sometimes it has decussating grooves on its surface, or is cellular or plumose, or resembling teeth, branches, bristles or hairs: in its crystallized state it is usually in small aggregate 6-sided tables with a right-angled 4-sided prism ending in a point or terminated at each end by an imperfect 4-sided prism, in cubes, or simple 3-sided or double 4-sided pyramids: it has no perceptible taste or smell, and does not alter or lose its lustre by any exposure to the air or water: its malleability is such, that one grain of gold may be beaten so thin as to cover  $56\frac{3}{4}$  square inches; so malleable, that an ounce of gold upon silver wire is capable of being extended more than 1300 miles; and so great is its tenacity, that a gold wire 0,078 inch in diameter is able to support a weight of 15,007 pounds avoirdupoise without breaking. The largest lump of native gold known was brought from *Wicklow*, and weighed 22 ounces; and contained in 24 parts, fine gold 21 $\frac{6}{10}$ , fine silver 1 $\frac{1}{10}$ , copper and iron alloy 0 $\frac{3}{10}$ .



- arenareum.** Combined with grains or particles of sand or other substances, and giving them a golden splendour.  
*Arena aurea.* *Syst. nat.* xii. 3. p. 198. n. 12.  
*Aurum terræ.* *Wall. syst.* 2. p. 358. n. 5.  
 Found in many rivers of *South America* and the adjacent islands, in *Africa*, *Arabia*, *India*, and many parts of *Europe*, more or less ponderous, and containing gold in greater or less quantities, sometimes so small as not to be worth working: the particles of gold may be separated by means of quicksilver or the nitro muriatic acid.
- larvatum.** Intermixed with other fossils in very minute particles, which are separable by means of quicksilver.  
*Aurum larvatum.* *Schmeisser mineral.* 2. p. 25.  
 Found in the mines of *Siberia*, *Transylvania*, *Hungary*, *Saxony*, *Sweden*, and *America*, combined with chalk, spar, alumina, siliceous porphyry, jasper, quartz, antimony, arsenic, &c. and is sometimes made whitish by various combinations of lead, spate of iron ore or sulphate of iron, copper or silver: the particles of gold are rarely visible to the naked eye.
- Platinum.** Yellowish-grey, in small grains, harder and heavier than pure gold.  
 Gold alloyed with Platina. *Schmeisser miner.* 2. p. 26.  
 Found in *Spanish America*, in small grains, involved in the platina, and may be disunited by dissolving the platina in nitro-muriatic acid and adding muriate of ammonia which precipitates the platina and leaves the gold in solution.
- argentiferum.** Of a pale yellow colour, lighter than pure gold.  
 Argentiferous gold. *Schmeisser mineral.* 2. p. 27.  
 Found in most gold mines, sometimes combined with nearly a fourth part of silver, in small particles or laminæ, filaments or 6-sided plates, seldom in large pieces, but usually dispersed through certain stones: it may be separated by digesting it with nitric acid which takes up the silver, and leaves the gold behind.
- Molybdeni.** Staining the fingers, of a lead colour and lustre, emitting flame and sulphurous vapours when burnt, and in a very violent heat leaving a button of pure gold.  
*Aurum molybd. mineralis.* *Born ind. foss.* 1. p. 68.  
 Found in the mines of *Nagyag* in *Transylvania*, and in those of *Hungary* near *Rimazombat*, and consists of various proportions of gold, oxide of molybdænum and sulphur.
- stibiatum.** Of a steel-yellow colour, emitting sulphurous vapours and flame with a white smoke when heated to whiteness.

Aurum antimon. mineral. *Born. ind. foss. 1. p. 68.*

Found near *Deutschlipfch* in *Hungary*, and near *Nagyag* in *Transylvania*, consisting of gold alloyed with common antimony: its surface is sometimes striate like the web of a feather.

*rufescens.* Of a reddish colour, emitting sulphurous flames when heated to whiteness.

Aurum pseudogalæna. *Born. ind. foss. 1. p. 69.*

Pseudogalæna aurifera. *Wall. syst. 2. p. 357. n. 4.*

Found near *Nagyag* in *Transylvania*, lamellar, of a semimetallic lustre, and contains zinc, oxyde of iron and sulphur besides the gold.

*cinereum.* Hardish, brittle, compact, of a yellowish steel-colour, emitting sulphurous flames and arsenical fumes when heated to whiteness.

Aurum minera argenti. *Born. ind. foss. 1. p. 68.*

Bismuthic gold. *Schmeisser miner. 2. p. 28.*

Found near *Nagyag* in *Transylvania*, and resembles in appearance grey copper-ore: it contains an alloy of silver mixed with sulphur and arsenic.

*albidum.* Whitish, yellowish internally, fibrous, emitting sulphurous flames and arsenical fumes when heated to whiteness.

Arsenicated gold. *Schmeisser mineral. 2. p. 30.*

Aurum ferro et arsenico. *Born. ind. foss. 1. p. 69.*

Found in the gold mines of *Nagyag* in *Transylvania*, and contains besides the gold, sulphur, arsenic and iron: the sulphur and arsenic may be separated by heat, the iron by muriatic and the gold by nitro-muriatic acid.

*wirescens.* Of a greenish-gold colour and rather obscure lustre, and minutely granular texture.

Guncr goldkies. *Bindb. schr. berl. natur. 4. p. 396.*

Found near *Nagyag* in *Transylvania* imbedded in quartz, and besides the gold contains sulphur, iron, copper and manganese. It is more than probable that some of these last species are ores of Tellurium.

*tyriticorum.* Of a gold-yellow colour, emitting sulphurous flames when made white hot.

Aurum pyrita. *Syst. nat. xii. 3. p. 152. n. 2.*

Aurum sulphure et ferro. *Wall. syst. 2. p. 356. n. 2.*

Gold pyrites. *Schmeisser miner. 2. p. 29.*

Found in the gold mines of *Sumatra*, *New Spain*, *Hungary*, *Sweden* and *Transylvania*, sometimes in a crystallized form, and consists of gold combined with sulphur by means of iron: the sulphur is discovered by torrefaction, the iron by muriatic acid, and the gold by nitro muriatic acid. It frequently yields from 30 to 40 ounces of gold in a hundred pounds weight.

82. ARGENTUM. Of a silvery colour not tarnished by the air, hard and tenacious, sonorous, exceedingly malleable and ductile, specific gravity before hammering 10,478: melting when perfectly red hot and its brilliancy much increased: soluble in nitric acid, giving no colour to the solution, and may be precipitated from it by copper, iron or zinc. *Silver.*

*nativum.* Malleable; ductile; with a metallic splendour internally, totally soluble in nitric acid.

Argentum nudum. *Syst. nat.* xii. 3. p. 148. n. 1.

Argentum nativum. *Wall. syst.* 2. p. 328. n. 1.

Native silver. *Kirwan mineral.* 2. p. 108.

Native silver. *Schmeisser miner.* 2. p. 38.

Native silver. *Thomson chem.* 4. p. 23.

Capillary silver. *Sowerby Brit. min. t.* 16.

Found in various parts of *Great-Britain*, particularly in the copper mines of *Cornwall*; in the mines of *Mexico* and *Peru*, and in most of the mines on the continent: it is rarely to be met with quite pure, but most commonly combined with a greater or less proportion of copper, and has sometimes its surface striate: it assumes various forms, and is sometimes found in prisms or cubes: in malleability it yields only to gold, as it may be beaten out into leaves the 160,000th part of an inch thick; and may be drawn out to so fine a wire, that a single grain can be extended nearly 400 feet in length; its tenacity is likewise such, that a wire 0,078 of an inch in diameter will support 17,813 pounds avoirdupoise without breaking: when melted, if the heat be increased, the liquid metal boils, and will at last be volatilized: when dissolved in nitric acid and precipitated in lime-water, it falls to the bottom in the form of a dark greenish brown powder: when dissolved in nitric acid and precipitated with mercury, it

shoots up in a shrub-like form, and is then called *Arbor Dianæ*: its solution is colourless, highly caustic, giving the skin, hair, and almost all animal substances an indelible black colour; and when evaporated till a pellicle begins to form on its surface, it deposits on cooling transparent crystals of nitrate of silver, from which is made the caustic material called *lapis infernalis* or *lunar caustic*: if its precipitate by lime-water be dried and washed with a solution of pure ammonia, it has a most dangerous fulminating property, exploding most violently on the slightest touch or friction. This powder is denominated *fulminating powder*.

*lustraceus*. Without lustre, friable, in thin pellicles intermixed with spar.

*Born. ind. foss.* 2. p. 110. *Kirwan* 2. p. 114.

Found in St. George's mine near *Andreasburg*: the pellicles are white, blue, or brownish.

*nigrum*. Deep black, friable, ponderous, effervescing with nitric acid, and recovering at last its metallic splendour when rubbed.

*Argentum fuliginosum*. *Syst. nat.* xii. 3. p. 150. n. 9.

*Argentum mineralisatum*. *Wall. syst.* 2. p. 335. n. 6.

Black silver. *Kirwan mineral.* 2. p. 117.

Black silver ore. *Schmeisser min.* 2. p. 50.

Black silver ore. *Thomson chem.* 4. p. 26.

Found in the silver-mines of *Sicily, Brittany, Saxony, Hungary, and Bohemia*, sometimes covering other minerals as with a coating, sometimes interspersed in larger or less particles, not unfrequently in a pulverised state: it commonly contains sulphur, arsenic and copper, and sometimes a little iron.

*corneum*. Ponderous, soft, malleable, without metallic lustre, somewhat diaphanous, easily melting in the fire and evaporating at last in a white fetid smoke.

*Argentum diaphanum*. *Syst. nat.* xii. 3. p. 148. n. 2.

*Argent. acid. sal. mineralis.* *Wall. syst.* 2. p. 331. n. 3.

Corneous silver ore. *Kirwan mineral.* 2. p. 113.

Muriat of silver. *Thomson chem.* 4. p. 30.

Corneous silver. *Schmeisser miner.* 2. p. 56.

Found in the mines of *Mexico, Peru, Siberia, Hungary, Bohemia, Saxony, Germany, &c.* it melts before a candle like wax or suet, and before the blowpipe leaves small grains of pure silver; soft and easily cut with a knife: colour white, grey, yellowish, green, violet or brown: sometimes it is found in irregular masses, sometimes in hollow globular pieces, or in thin plates, or in a state of powder, or crystallized in small cubes or in accumulated flakes, or in a cicular, rarely capillary

prisms: it melts very easily, becomes purple on exposure to the sun, and has a waxy lustre: the best kind contains about 72 per cent. of silver, which may be extracted by separating the sulphur and decomposing the remainder with soda, which when mixed with it and exposed in a crucible to heat, combines with the acid, and leaves the silver in its pure state: specific gravity from 4,745. to 4,804: contains silver 67,75. oxyde of iron 6,00. muriatic acid 21,00. sulphuric acid 0 25. alumina 1,75. *Klaproth.*

*Electrum.* Malleable, ductile, with a metallic lustre, yellowish, not wholly soluble in nitric acid.

*Veltheim n. Ent. chem. 7. p. 75.*

Auriferous native silver. *Kirwan mineral. 2. p. 109.*

Auriferous silver. *Thomson chem. 4. p. 23.*

Found in the mountain *Schtangenberg* in *Siberia*, and in the mines near *Kongsberg* in *Norway*, of a yellowish-white colour or that of pale brass; rarely in solitary masses, but generally disseminated, or filiform, or reticular, or in spangles: specific gravity above 10,600: a specimen from Norway examined by Dr. Fordyce, contained silver 72. gold 28. It may be easily separated by dissolving the mass in nitric acid, which decomposes the silver, leaving the gold untouched.

*stibiatum.* With a metallic lustre, tin-white, malleable, very hard, lamellar, not emitting sulphuric nor arsenical vapours when burnt: leaving a white oxyde when acted on by nitric acid.

*Selb magaz. Berkbauk. 3. 1786. n. 1. p. 1.*

Antimoniated native silver. *Kirwan mineral. 2. p. 114.*

Antimoniated silver ore. *Thomson chem. 4. p. 24.*

Found near *Wittichen* in the district of *Turlenburg*, in irregular grains or lumps or kidney-form pieces, or crystallized in irregular 4, 6, or 8-sided prisms which are striated longitudinally: colour white, texture laminar, fracture conchoidal: before the blowpipe the antimony evaporates in a grey smoke, and leaves a brownish slag which tinges borax green: it gives a greyish-black powder, and does not decrepitate when heated: with quicksilver it amalgamates easily without the assistance of heat: it is not soluble in nitro-muriatic acid, but may be dissolved in boiling nitric acid, leaving a residuum of about 27 per cent. specific gravity from 94,406. to 10,000. contains in its purer state silver 84. antimony 16. *Klaproth.*

*arseniaceum*. With a metallic splendour, easily melting and emitting arsenical vapours.

*Werner Samml. phys. natur.* 1. p. St. 4. p. 454.

Arsenicated silver. *Schmeisser miner.* 2. p. 42.

Arsenicated native silver. *Kirwan mineral.* 2. p. 111.

Arsenical silver. *Thomson chem.* 4. p. 25.

Found in the mines near *Andreasburg* in *Hercynia*, sometimes of a steel-white colour and lustre and containing a little iron, sometimes pale ochre-yellow: its hardness is often considerable, and then it is fibrous internally, sometimes it is so soft as to be easily cut with a knife and in curved foliations: commonly found in round irregular lumps or crystallized in 6-sided prisms or pyramids: contains silver 12,75. iron 44,25. arsenic 35,00. antimony 4,00. *Klaproth*.

*molybdænum*. With a metallic splendour, in thin flexible plates.

*Freber nov. act. petrop.* 3. p. 267.

Molybdenic silver ore. *Schmeisser mineral.* 2. p. 51.

Found near *Deutschpilsen* in *Hungary*, in thin broad shining plates, placed one over the other, sometimes nearly an inch in thickness, in grey alumina: it gives a grey streak to paper, and has something the resemblance of common Molybdænum: it has sometimes a little iron mixed with it, and usually yields 23 ounces of silver in a hundred weight.

*vitreum*. Of a dark blueish-grey colour, easily melting and emitting during combustion sulphurous flames and vapours, opaque, very ponderous, soft, tenacious.

Argentum mineralisat. *Syst. nat.* xii. 3. p. 148. n. 3.

Argent. sulph. mineralis *Wall. syst.* 2 p. 329. n. 2.

Sulphurated silver ore. *Kirwan mineral.* 2. p. 115.

Vitreous silver. *Schmeisser miner.* 2. p. 44.

Sulphuret of silver. *Thomson chem.* 4. p. 26.

Found in the mines of *Siberia*, *Norway*, *Saxony*, *Bohemia*, *Hungary*, *Spain*, and *America*, generally superficial and running like veins through other fossils: colour deep lead-grey, greyish black, or steel-blue, with very little metallic lustre, and sometimes variegated on the surface: its appearance is rarely massive, but most commonly in thin plates, granular, capillary, arborescent, or crystallized in cubes or in double 4 or 6-sided pyramids: internally it has more of a metallic lustre; is soft enough to bear impressions like lead, and melts easily into a vitreous mass. It is one of the richest ores of silver, containing usually 85 per cent. of pure silver: specific gravity from 6,909. to 7,215.

*fragile.*

Of a black lead-colour, without metallic lustre, opaque, easily melting with sulphuric flames and vapours, brittle.

Roeschgewacchs. *Vogel. mineral.* p. 445.

Antimoniated silver ore. *Kirwan min.* 2. p. 118.

Brittle silver ore. *Schmeisser miner.* 2. p. 50.

Antimoniated sulphuret. *Thomson chem.* 4. p. 27.

Found in the mines of *Dauphigny, Saxony, Bohemia, Hungary, and Siberia*, and resembles the last except in being rendered brittle by an admixture of iron and antimony: colour iron-grey, azure or dark blue when tarnished, with little metallic lustre, and of a compact texture: it is generally found massive or disseminated, sometimes crystallized in indistinct and accumulated 6-sided prisms, or tables, or rhombs: before the blowpipe the sulphur and antimony evaporate, leaving a button, which may be separated from the iron by fusion with nitre and borax: specific gravity 7,208: contains silver 66,5. sulphur 12,0. antimony 10,0. iron 5,0. silica 1,0. arsenic and copper 0,5. *Klaproth.*

*nitens.*

Shining, of a lead-colour, ponderous, lamellar, brittle, easily melting.

*Renovanz. v. alt. Gab.* p. 137.

Cupriferous sulphurated silver. *Kirwan* 2. p. 121.

Cupriferous sulphuret. *Thomson chem.* 4. p. 28.

Found in the *Korbolokinsk* mountains of *Siberia*, in the fissures of hornstone rocks, in irregular lumps of various sizes: its powder when rubbed between the thumb and finger gives a black colour to the skin with a lead gloss: when heated part is first fused and resembles sulphurated silver, the remainder is of much more difficult fusibility and resembles black copper: it communicates a blue colour to nitric acid, and when dissolved in it deposits sulphur: contains about silver 42. copper 21. sulphur 35. *Thomson.*

*rubrum.*

Ponderous, red when scraped, a little shining internally, decrepitating in the fire, and afterwards melting with an arsenical smell.

Argentum rubescens. *Syst. nat.* xii. 3. p. 149. n. 4.

Argentum sulphure, &c. *Cronst. min. syst.* 169.

Argentum arsenico mineralif. *Wall. syst.* 2. p. 333. n. 4.

Argentum rubrum. *Wolterjd. min.* 29.

1. Of a colour between blood and cochineal-red, sometimes variegated: streak orange-red: powder black.

Silver with antimony, &c. *Schmeisser mineral.* 2. p. 55.

Light red silver ore. *Kirwan mineral* 2. p. 122.

Light red silver ore. *Thomson chem.* 4. p. 29.

2. Colour between dark red and lead-grey, or nearly black : streak dark crimson red.

Dark silver ore. *Kirwan miner.* 2. p. 123.

Ruby silver ore. *Schmeisser miner.* 2. p. 46.

Dark red silver ore. *Thomson chem.* 4. p. 29.

Found in various mines of *Peru, Chili, France, Spain, Germany, Saxony, Hungary, &c.* with arsenic, galena, or other ores of silver, in masses, or disseminated, sometimes stalactitical or botryoidal, or crystallized in small prisms or acicular pyramids, or radiated in a stellate manner; it differs much in degree of transparency, colour, texture, and form: it is friable or brittle, but so soft as to be cut with a knife; when broken it has a glassy appearance, and when scraped with a knife the particles appear scarlet: texture flat conchoidal, or approaching to the foliated: when heated it crackles, and melts very easily before the blowpipe, blackening, burning with a blue flame, and giving out a white smoke with a slight smell of garlic: it becomes electric by friction, but only when insulated; and is soluble in nitric acid without effervescence: it detonates with nitre when thrown into a red hot crucible, and becomes then capillary silver: specific gravity from 5,440. to 5,692. contains silver 56. antimony 16. sulphur 15. oxygen 12. and a little arsenic. *Klaproth.*

*album.*

Opake, with a metallic lustre, compact, ponderous, of a pale lead colour externally and when scraped, emitting sulphurous and arsenical vapours when burnt, brittle.

Argent. mineralisat. cupri, &c. *Syst. nat.* xii. 3. p. 149. n. 5.

Argent. arsenico, &c. *Wall. syst.* 2. p. 334. n. 5.

Argent. arsenico, &c. *Cronst. mineral. sect.* 170. 3. 3.

Plumbiferous silver ore. *Kirwan mineral.* 2. p. 119.

Grey silver ore. *Schmeisser mineral.* 2. p. 52.

Found in the mines of *Saxony, Bohemia, Hungary, Sicily, &c.* generally imbedded in quartz and other minerals: it contains generally about 15 per cent. of silver, the remainder being made up of sulphur, arsenic, copper, and iron in various proportions: when scraped it exhibits a brighter surface but of the same colour: it breaks into indeterminate fragments, and is of a flat texture: it is generally found of a common form, rarely crystallized; is brittle, but so soft as to be cut with a knife.



83. **HYDRARGYRUM.** Of a silvery-white colour becoming gradually blacker in the air, always in a state of fluidity in the common temperature of the air, becoming solid and malleable at a temperature of  $0,39^{\circ}$ , specific gravity 13,568: evaporating in a low heat: soluble in most acids and imparting no colour to the solution; when dissolved in muriatic acid and mixed with lime-water precipitating an orange-red powder. *Quicksilver.*

*virginum.* Pure, fluid, very ponderous, of a silvery colour and lustre.

Hydrargyrum nudum. *Syst. nat.* xii. 3. p. 119. n. 1.

Mercurius virgineus. *Wall. syst.* 2. p. 148. n. 1.

Mercurius natus. *Cronst. miner.* 215.

Argentum vivum. *Aët. Ups.* 1720. n. 3. p. 55.

Native mercury. *Kirwan miner.* 2. p. 223.

Native mercury. *Schmeisser miner.* 2. p. 62.

Native mercury. *Thomson chem.* 4. p. 33.

Found in the quicksilver-mines near *Sahlberg* in Sweden, at *Almaden* in Spain, *Idria* in Bohemia, in the Palatinate near *Wolffstein* and *Moersfeld*, in the dutchy of *Deux ponts*, and on the mountain *Stahlberg*, &c. in small globules scattered through different kinds of stones, clays and ores, and may be easily extracted by evaporation: specific gravity about 13,600.

*Amalgama.* Ponderous, of a silvery colour and lustre, rather solid, evaporating when heated and leaving pure silver.

Amalgama. *Cronst. miner. sect.* 215.

Native amalgama. *Kirwan miner.* 2. p. 223.

Native amalgam. *Schmeisser mineral.* 2. p. 63.

Amalgam of silver. *Thomson chem.* 4. p. 33.

Found in the mines of Hungary near *Zlana*, near *Moschellarsburg* and on the mountain *Stahlburg* in the dutchy of *Bipontium*, and in Sweden, rarely in larger masses imbedded in quartz, hornstone or spar, but generally running through other ores of quicksilver, sometimes in imperfect cubes, prisms or pyramids: colour silvery-white or grey, sometimes tarnished in an iridescent manner: it is brittle or soft according to the proportion of mercury, but is generally soft enough to bear the impression of the thumb-nail, and when cut with a knife gives a creaking noise: when rubbed on gold it leaves a white streak: specific gravity above 10,000: contains about mercury 64. silver 36. *Klaproth.*

*sublimatum.* Without metallic lustre, subliming almost entirely before the blowpipe in the form of a white smoke without sulphurous flame or vapours.

*Woulfe's Experiments.* 1777. p. 4.

*Suckow Besch. des natürl. Turp.* p. 8.

*Baumer hist. merc. corn.* 1785. *Kirwan* 2. p. 226.

Corneous mercury. *Schmeisser. miner.* 2. p. 73.

Muriat of mercury. *Thomson chem.* 4. p. 36.

Found in the mines of *Wolfstein* and *Moersfeld* in the *Palatinate*, and near *Moschellandsburg* in the dutchy of *Deux ponts*, in scales or grains, or crystallized in small 4-sided prisms terminated by 4-sided rhomboidal summits, or 4-sided pyramids with the angles truncate: colour smoke-grey, yellowish-grey, yellowish-white, lemon-yellow, or greenish, rarely blackish: the crystals have a pearly lustre, are semitransparent and soft, and have a foliated texture: when thrown on red hot charcoal they discover a smell like garlic, and when mixed with lime-water occasion an orange-coloured precipitate: it consists of mercury combined with sulphuric and muriatic acids in various proportions.

*larvatum.* Deep red, of an earthy texture, heavy, subliming its mercury by heat.

Red native precipitate. *Schmeisser* 2. p. 65. *Kirwan* 2. p. 226.

Red oxyde of mercury. *Thomson chem.* 4. p. 36.

Found mixed with sand near *Alicant* in *Spain*, and in the soil in the mercury-mines of *Idria* and *Buschians*, compact and heavy, and is generally mixed with globules of mercury: when heated in a close vessel it yields oxygene and a little carbonic acid gas, and the mercury becomes recovered: it appears to be the red oxyde of mercury combined with alumina or bituminous marl: generally contains about 0,91 of mercury.

*Æthiops.* Black, without lustre or transparency, staining the fingers, easily melting, and if the heat be increased entirely subliming with a sulphurous smell and flame.

*Freber nov. act. petrop.* 3. p. 268.

*Hacquet chem. annal.* 3. p. 481.

Native æthiops. *Kirwan miner.* 2. p. 227.

Æthiops mineral. *Schmeisser miner.* 2. p. 67.

Found in the mines of *Nassau* near *Kirchheim*, and in those of *Idria*, generally in a loose powdery state of a black or greyish-black colour, and accompanied by lamellated cinnabar or sulphur pyrites: it consists of mercury merely mixed with sulphur: specific gravity 2,223. *Hahn.*

*Cinnabaris.* Ponderous, without metallic lustre, red, scarlet when scraped, easily melting, dissipating before the blow-pipe with a blue flame and sulphurous smell.

Hydrarg. mineralis. pyriticos. *Syst. nat.* xii. 3. p. 119. n. 3.

Mercurius sulphure mineralis. *Wall. syst.* p. 150. n. 2.

Native Cinnabar. *Kirawan miner.* 2. p. 228.

Native Cinnabar. *Schmeisser miner.* 2. p. 66.

Sulphuret of Mercury. *Thomson chem.* 4. p. 34.

1. Cochineal red, hard, of a foliated or uneven fracture, sp. cific gravity when pure 10,128.
2. Scarlet, soft, of a fibrous or earthy fracture, specific gravity when pure 6,902.
3. Crystallized.

Found in *Peru, Chili, New Spain, Japan, China, Siberia, Hungary, Sicily, Germany, &c.* disseminated, in veins, grains, or ramifications, in a matrix of indurated clay, white and ferruginous quartz, calcareous spar, argillaceous shist, or pyrites: colour various shades of red, sometimes greyish: the crystals are 3 or 4-sided pyramids single or double, 3 sided prisms with 3 sided pyramids, or 6 sided prisms: more or less shining, and of an earthy, lamellar, compact, fibrous, or granular texture: the softer kinds stain the fingers and make a red mark: it is insoluble in nitric acid, and contains about 80 of mercury and 20 of sulphur.

*hepaticum.* Ponderous, of a common form, burning with a blue flame but evaporating only in part.

*Brunnich Cronst. miner.* 216. B. 1.

Hepatic mercurial ore. *Kirawan mineral.* 2. p. 224.

Hepatic mercury. *Schmeisser mineral.* 2. p. 69.

Hepatic mercurial ore. *Thomson chem.* 4. p. 35.

1. Of a compact texture.  
*Kirawan mineral.* 2. p. 225. *Schmeisser* 2. p. 70.

2. Of a flaty texture.  
*Kirawan* 2 p. 226. *Schmeisser* 2. p. 70.

Found in the mines of *Idria*, and is nothing but cinnabar mixed with indurated clay: colour dark red or liver-brown, greenish, bluish, or lead colour, or speckled green or blue: texture compact, nearly even, shining and taking a polish, sometimes so soft as to be cut with a knife, and leaves a red mark: specific gravity 7,186: it is not soluble in nitric, but easily in muriatic acid.

*cupriferrum:* Dark-grey, of a glassy texture, decrepitating and emitting sulphurous flames when heated, and before the blow-pipe leaving a bead of copper.

Hydrargyrum crepitans. *Syst. nat.* xii. 3. p. 120. n. 5.

Mercurius sulphure, &c. *Wall. syst.* 2. p. 151. n. 3.

Cupreous mercury. *Schmeijer mineral.* 2. p. 71.

Greyish-black mercury. *Kiwan min.* 2. p. 231.

Found in beds of potstone, quartz and shist, in the mines near *Moschellandsburg* and *Sumatra*, in a compact brittle heavy state, and of a grey or blackish colour: when fresh broken it has a glassy appearance: it gives a red streak, and before the blowpipe melts with borax into a green glass: it contains more or less of sulphur and copper.

*glandulosum* Without metallic lustre, red with a scarlet streak, emitting sulphurous flames and arsenical vapours when heated.

Hydragyrum arsenicale. *Syst. nat.* xii. 3. p. 120. n. 4.

Mercurius ruber. *Cronst. mineral.* 63.

Found in the mines of *Japan*, and contains mercury mineralized by sulphur and arsenic.

*mixtum.* In the form of white lumps, emitting sulphurous and arsenical vapours when heated.

Mercurius mitis. *Monet syst. min.*

Mercury mixed with silver, &c. *Schmeiss.* 2. p. 74.

Found in the mines of *Dauphiny*, and contains mercury 1 part, silver  $\frac{1}{3}$ , and the remainder iron, cobalt, arsenic and sulphur.

*phlogisticum* Of a dull opake colour, ponderous, brittle, flaming and emitting disagreeable vapours when heated.

*Brunnich Cronst. min.* 216. B. 2.

Found in the mines of *Idria*, and contains a large portion of quicksilver.

*fatens.* Dark red-brown, lamellar, somewhat pellucid, smelling like liver of sulphur when rubbed.

*Born chem. annal.* 1789. 1. p. 316.

*Hacquet chem. annal.* 3. p. 480.

Bituminous mercury ore. *Schmeisser* 2. p. 72.

Found in the mines of *Idria* on hornstone, has an earthy texture and flames when kindled, the vapours of which have the smell of bitumen: it yields from 15 to 20 per cent. of mercury.

84. CUPRUM. Fine red easily tarnishing in the air, hard and tenacious, malleable and ductile, sonorous and elastic, specific gravity 8,667: melting with difficulty, and when exposed to a red heat taking fire and emitting a most brilliant green light; exploding violently when melted and cast into water: soluble in most acids and ammonia, exhibiting a blue colour; from its solution in nitric acid precipitating a blue oxyde by the addition of potash: tinging glass green.

*Copper.*

*nativum.* Uncombined.

Cuprum nudum. *Syst. nat.* xii. 3. p. 145. n. 2.

Cuprum nativum. *Wall. syst.* 2. p. 274. n. 1.

Native copper. *Kirwan miner.* 2. p. 128.

Native copper. *Schmeisser mineral.* 2. p. 126.

Native copper. *Thomson chem.* 4. p. 37.

2. Precipitated by a vitriolic solution.

Cuprum præcipitatum. *Syst. nat.* xii. 3. p. 178. n. 3.

Præcipitated copper. *Kirwan miner.* 2. p. 128.

3. Crystallized in 8-sided figures.

Cuprum crystallifatum. *Syst. nat.* xii. 3. p. 143. n. 3.

*Gmel. syst. nat.* 3. p. 446. tab. 1. fig. 23.

*Sowerby Brit. miner. tab.* 17. 25.

Found in Cornwall, Anglesea, Wicklow in Ireland, on the shores of the Copper island near Kamtschatka, in Iceland and the Feroe islands, Hungary, Siberia, Sweden, Norway, and many parts of the old and new world; in compact masses, plates, threads, and arborescent and botryoidal figures of various forms; sometimes crystallized in cubes or double 4-sided pyramids: texture sometimes granulated, rarely lamellar: superficial colour when tarnished greenish-yellow, or reddish with a pale green, bluish or variegated: when hard and compact it takes a fine polish, and exhibits a rich metallic lustre, but soon tarnishes by the action of the air and contracts a greenish rust called verdegriis: specific gravity from 7,600 to 8,667.

*lateritium.* Red, soft, without metallic lustre.

Ochra cupri. *Syst. nat.* xii. 3. p. 193. n. 6.

Cuprum corrosum. *Wall. syst.* 2. p. 290. n. 16.

Earthy red ore. *Kirwan mineral.* 2. p. 138.

Red earthy oxyde. *Schmeisser miner.* 2. p. 130.

Copper ochre. *Thomson chem.* 4. p. 43.

Found in the mine of *Saxony*, in compact lumps sprinkled in small particles. colour hyacinth red, more or less inclining to brown or yellow: texture generally earthy, rarely imperfectly conchoidal, and often covering other fossils as with a crust: it is easily pulverisable, and makes a considerable stain on paper: when breathed on gives an earthy smell: it soft in decrepitates and blackens in the fire, and is not totally soluble in acids or volatile alkali: it has a greater or less mixture of iron, and contains from 30 to 54 per cent. of oxyde of copper.

*rubrum.*

Of a dull red or brownish-red colour, hardish, without metallic lustre.

Cuprum rubrum. *Syst. nat.* xii. 3. p. 145. n. 9.

Cupr. minera solida. *Wall. syst.* 2. p. 226. n. 3. a.

Compact red ore. *Kirwan mineral.* 2. p. 135.

Red copper glass. *Schmeisser miner.* 2. p. 132.

Glass copper ore. *Berkenb. outl.* p. 263.

Red copper ore. *Thomson chem.* 4. p. 42.

Red oxyde of copper. *Sowerby Brit. min. tab.* 53. 100.

Found in the mines of *Cornwall, India, Siberia, Hungary*, &c. in compact masses of a common, lamellar, or fibrous texture, and often crystallized in cubes, prisms or pyramids: colour various shades of cochineal red, making a bright red streak, and giving a red powder: it decrepitates and turns black in the fire, is soluble in nitric acid with effervescence and in the muriatic without effervescence: to the nitric acid it gives a green tinge, and a blue one to volatile alkali: it frequently contains nearly 70 per cent of copper.

*hepaticum.*

Brown, soft, without metallic lustre.

Cuprum colore hepatico. *Wall. syst.* 2. p. 276. n. 3. b, c.

Hepatic copper. *Schmeisser miner.* 2. p. 131.

Found commonly with the red oxyde in the mines of *Sweden, Saxony, Austria*, &c. sometimes in an earthy and friable state, sometimes compact and indurated, not unfrequently covering other ores in stalactitical concentric layers: colour greyish, yellowish, or reddish-brown: it sometimes contains a small quantity of silver, and is chiefly composed of oxyde of copper and iron: it yields from 2 to 20 per cent. of copper.

*piceum.*

Black, hardish, without metallic lustre.

Cuprum ferro et paux. sulph. *Wall. syst.* 2. p. 280. n. 6.

Indurated copper. *Schmeisser miner.* 2. p. 131.

Found in the mines of *Hercynia* and *Austria*, in a lamellar or imperfectly conchoidal state, or coating copper pyrites: colour brownish-black, or dark yellowish brown: it contains a large quantity of iron, and yields 7 or 8 per cent. of copper.

*fuliginosum*. Black, superficial.

Cuprum corrosum. *Wall. fyst. 2. p. 291. n. 17.*

Cuprum fuliginosum. *Cronst. miner.*

Black copper. *Schmeisser mineral 2. p. 131.*

Found in the mines of *Hungary*, *Saxony*, and *Sweden*, generally in a friable state, and seems to have been produced by pyritical copper ore or mundic which has been decomposed with iron.

*cœruleum*. Sky-blue, soft, without metallic lustre, soluble in acids without effervescence and giving them a green colour.

Ochra cupri cœrulea. *Syst. nat. 1. p. 162 n. 4.*

Cuprum cœruleum. *Wall. fyst. 2. p. 289 n. 15.*

Earthy mountain blue. *Kirawan. miner. 2. p. 129.*

Oxy-carbonate of copper. *Schmeisser miner. 2. p. 136.*

Blue carbonate of copper. *Thomson chem. 4. p. 43.*

Mountain blue. *Berkenhout outl. p. 263.*

2. With a mixture of lime, and generally in a state of powder.

Lapis armenus. *Syst. nat. xii. 3. p. 146. n. 14.*

Lapis armenus. *Kirawan mineral. 2. p. 153.*

Cærul. montan. lapide calcar. *Wall. fyst. 2. p. 289. n. 15. f.*

Blue friable copper ore. *Schmeisser miner. 2. p. 136.*

Found in the mines of *Cornwall*, *Derbyshire*, &c. in *Armenia*, *Siberia*, *Hungary*, *Saxony*, &c. massive and earthy: colour often verging to green: it is sometimes found in a powdery state, and sometimes investing other ores: contains often copper 69, carbonic acid 29, water 2.

*Cuprigo*. Sky or smalt blue, without metallic lustre, entirely soluble in acids with effervescence and giving them a green colour.

Ochra Cuprigo. *Syst. nat. xii. 3. p. 194. n. 12.*

Striated blue ore. *Kirawan mineral. 2. p. 130.*

Radiated or fibrous azure ore. *Schmeisser 2. p. 137.*

Radiated blue carbonate of copper. *Thomson chem. 4. p. 44.*

Carbonate of copper. *Sowerby Brit. min. t. 94.*

Found in most of the copper mines of *Europe*, generally in small granular particles dispersed through different stones, stalactitical, botryoidal, or crystallized in rhomboidal prisms with 4-sided summits: texture sometimes earthy, generally striate

or radiate: sometimes crystallized in rhomboidal prisms with 4-sided summits: it leaves a sky-blue trace, and is brittle: before the blowpipe it blackens, and tinges borax green with effervescence: specific gravity 3,608: contains copper 66 to 70, carbonic acid 18 to 20, oxygen 8 to 10, water 2. *Pelletier.*

*viride.* Pale verdegriis green, soluble in acids without effervescence, its solution in volatile alkali becoming blue, without lustre, of a conchoidal texture.

Found in the mines of *Siberia*, *Saxony*, and *Norway*, sometimes superficial, sometimes intermixed with other minerals: opake, becoming black in the fire: of a common form, or botryoidal or kidney-form.

*argillosum.* Soft, green, shining internally, of a conchoidal texture.

*Renovanz Nach. v. altaisch. Gebirg. p. 53.*

Argillaceous copper ore. *Schmeisser miner. 2. p. 150.*

Found in the Altaic mountains of *Siberia*, and adheres to the tongue in consequence of its mixture with alumina: colour light or dusky-green or brownish-green: it may be easily cut with a knife, and contains from 24 to 30 per cent. of copper.

*talcosum.* Sea-green, very soft, making a streak.

*Renovanz Nach. v. Altaisch. Geb. p. 51.*

Found in the mines on the Altaic mountains of *Siberia*, in the cavities or crevices of metallic or aluminar minerals, and has small particles of talc intermixed with it: colour sometimes very pale green, and occasionally exhibiting a metallic lustre or transparency: its texture lamellar or fibrous in a stellate manner.

*Ærugo.* Green, giving a blue colour to ammonia, effervescing with nitric acid, opake, without metallic lustre.

Cuprum corrosum. *Wall. syst. 2. p. 286. n. 14.*

Green copper ore. *Kirwan mineral. 2. p. 131.*

Green copper ore. *Schmeisser miner. 2. p. 137.*

Green carbonate of copper. *Thomson chem. 4. p. 45.*

Mountain green. *Berkenb. outl. p. 263.*

1. Soft, brittle, of an earthy or minutely conchoidal fracture.

Ochra æris. *Syst. nat. xii. 3. p. 192. n. 3.*

Chrysocolia. *Cost. foss. 100.*

Mountain green. *Kirwan miner. 2. p. 134.*

Mountain green. *Schmeisser miner. 2. p. 140.*

Common mountain green. *Thomson chem. 4. p. 45.*



2. Hard, brittle, taking a fine polish, fracture conchoidal finely fibrous or lamellar.  
 Cuprum viride gypseum. *Syst. nat.* xii. 3. p. 146. n. 15.  
 Terra gypsea venere mixta. *Cronst. min.* 36.  
 Compact Malachite. *Kirwan mineral.* 2. p. 132.  
 Compact Malachit. *Schmeisser miner.* 2. p. 138.  
 Compact Malachite. *Thomson chem.* 4. p. 45.
3. Hard, brittle, of a fibrous or radiated fracture and silky lustre.  
 Ochra cupri germinans. *Syst. nat.* xii. 3. p. 194. n. 11.  
 Fibrous Malachite. *Kirwan miner.* 2. p. 131.  
 Radiated Malachit. *Schmeisser mineral.* 2. p. 137.  
 Fibrous Malachite. *Thomson chem.* 4. p. 45.  
 Buffus-like Carbonate of Copper. *Sowerby.* t. 47.  
 Green Malachite. *Rasleigh fasc.* 1. t. 7. f. 6.
4. Crystallized in slender needles.

Found in the various copper mines of *Great-Britain, Africa, Siberia, Hungary, Saxony, Bohemia, &c.* in solid masses or in small particles interspersed in different matrices, or in various forms as kidney-shaped, botryoidal, stalactitical, or in concentric layers: colour from a dull to a light apple-green: lustre usually silky: before the blowpipe it decrepitates and blackens, but does not melt, and gives a green colour to the flame: it effervesces with nitric acid, and tinges borax yellowish-green and alkalis blue: specific gravity from 3,571. to 3,653: a specimen from Siberia contained copper 58,0. carbonic acid 18,0. oxygene 12,5. water 11,5. *Klaproth.*

*ferrugine-*  
*um.*

Olive-green, soluble in muriatic acid with effervescence, and the solution giving a blue precipitate with prussiate of potass, without metallic lustre.

1. Of an earthy texture, friable, clear olive-green.  
 Cuprum ochraceum. *Karsten Leske mineral.* 1. p. 425.  
 Ferruginous green Copper ore. *Schmeisser* 2. p. 141.
2. Of a compact and slag-like state, dark olive-green.

Found near *Camsdorf* in *Saxony*, and near *Sealsfeld*, in compact lumps or small particles interspersed through other minerals: texture generally more or less conchoidal, and is sometimes a little shining: when rubbed it leaves a green trace: it is composed of copper, iron, oxygene, and carbonic acid.

*arsenical.* Dull olive-green, becoming blue with prussiate of potass, emitting arsenical fumes before the blowpipe and leaving a ductile copper bead.

*Klaproth Schreb. Berl. Naturf.* 7. p. 160.

*Philosophical Transact.* 1801. p. 169, &c.

Olive Copper ore. *Kirwan mineral.* 2. p. 151.

Arseniate of Copper. *Schmeisser mineral. 2. p. 152.*

Arseniat of Copper. *Thomson chem. 4. p. 47.*

Arteniate of Copper. *Sowerby min. t. 31, 32, 37. 93.*

Found in the Carrarack mine in *Cornwall*, and near *Jonsback* in *Silesia*, in cliffs of quartz: colour various shades of green; sometimes inclining to brown, generally in transparent crystals of various forms: specific gravity from 2,548 to 4,208: a fine specimen contained oxyde of copper 50,62. arsenic acid 45,00. water 350. *Klaproth.*

*resellatum.* Green, in small shining clustered cubical crystals; emitting arsenical fumes when burnt.

*Klaproth schreb Berl. Naturf. 7. p. 160.*

*Sowerby Brit. miner. tab. 31, &c.*

Found with the last, of which it seems to be a mere variety: it probably contains a little iron.

*arenaceum.* Grass-green, of the consistence of sand, soluble in acids without effervescence, burning with green and blue flames when thrown on hot coals.

Green sand of Peru. *Kirwan miner. 2. p. 149.*

Muriat of Copper. *Thomson chem. 4. p. 46.*

Found in *Peru*, and when examined through a glass appears a mixture of transparent green particles with quartz: contains oxyde of copper 73,0. muriatic acid 10,1. water 16,9. *Klaproth.*

*phosphoratum.* Greyish-black externally, emerald green within, soft, of a divergently fibrous fracture, opaque.

Phosphat of Copper. *Thomson chem 4 p 46.*

Found at *Rheinbreidbach* near *Cologne*, in lumps, or dispersed through other minerals, or in minute 6 sided clustered crystals: lustre glassy without, silky internally: it makes an apple-green scratch: contains oxyde of copper 68,13. phosphoric acid 30,95. *Klaproth.*

*album.* Hardish, whitish, with a metallic lustre, emitting arsenical vapours when burnt.

Cupr. arsenic. album. *Syst. nat. xii. 3. p. 145. n. 8.*

Cupr. arsenico et ferro. *Wall. syst. 2. p 280 n. 7.*

White Copper ore. *Kirwan miner. 2. p. 152.*

White Copper ore. *Schmeisser miner. 2. p. 142.*

White Copper ore. *Thomson chem. 4. p. 38.*

Found with other copper ores in the *Middleion Lys* veins, and in the mines of *Hungary*, *Siberia*, *Germany* and *Saxony*, interspersed with other fossils in larger or smaller lumps, and sometimes crystallized in 4-sided double pyramids: colour steel or silvery-grey, often reddish-brown: powder grey,

with sometimes a tinge of red: texture compact, very brittle, and when rubbed emitting the smell of arsenic: it consists of copper, iron, arsenic, sulphur, and sometimes a little silver.

*purpureum.* Hardish, with metallic lustre, brittle, red or blue.

Cuprum pyriticolum. *Syst. nat.* xii. 3. p. 144. n. 5.

Cupr. fulph. et ferro *Wall. Syst.* 2. p. 278. n. 5.

Purple Copper ore. *Kiawan miner.* 2. p. 142.

Variegated Copper ore. *Schneisser min.* 2. p. 147.

Purple Copper ore. *Thomson chem.* 4. p. 40.

Found in *America, Siberia, Lapland, Norway, Saxony, Germany, &c.* generally mixed with other ores of copper, in masses, plates, or disseminated: colour copper-red, brown, purple, azure, blue or green: streak reddish and metallic: texture conchoidal, brittle: with nitric acid it effervesces and tinges it green, deflagates with nitre, and melts before the blowpipe with smell, smoke or vapour: specific gravity from 4,956 to 4,983: contains copper 58, iron 18, sulphur 19, oxygene 5. *Klaproth.*

*cinereum.* Hardish; brittle, with metallic lustre; compact, of a steel-grey colour.

Cuprum cinereum. *Syst. nat.* xii. 3. p. 144. n. 7.

Cupr. arsen. fulph. *Wall. Syst.* 2. p. 281. n. 8.

Grey Copper ore. *Kiawan mineral.* 2. p. 146.

Grey Copper ore. *Schneisser miner.* 2. p. 148.

Grey Copper ore. *Thomson chem.* 4. p. 41.

Found in *Cornwall, Saxony, Hungary, Siberia, Germany, &c.* sometimes amorphous, sometimes in 4 sided crystals with the edges often truncated: colour steel grey, often tarnished or variegated: streak dark grey, often reddish-brown: powder blackish, with frequently a tinge of red: with nitre it deflagates, and melts with crackling before the blowpipe: it tinges borax yellowish or brownish red: specific gravity 4,864. contains when pure, copper 31,36. sulphur 11,50. antimony 34,09. silver 14,77. iron 3,30. alumina 0,30. *Klaproth.*

*fatidum.* Hard, with metallic lustre, of a lead colour, and conchoidal texture, emitting a disagreeable smell when pounded.

*Renowanz v. Altaisch Geb.* p. 142.

Found on the mountain *Schlangenburg* in *Siberia*, and contains 45 per cent. of copper and a little silver.

*pittacinum.* Ponderous, dull parrot-red, radiated, breaking into splinters, often forming crusts.

*Renovanz v. Altaisch. Geb. p. 235.*

Peacock's tail Copper ore. *Schmeisser 2. p. 147.*

Found in the Altaic mountains of *Siberia*, and contains from 15 to 20 per cent. of copper and a little silver.

*altaicum.* Hardish, with a weak lustre, hoary, brittle, of a fine splintery texture.

*Renovanz v. Altaisch. Geb. p. 235.*

Found in the mines of *Siberia*, and contains about the same proportion of copper as the last: it tinges ammonia green.

*plumbeum.* Of the colour and lustre of lead, and of a flat texture.

*Linck chem. annal. 1790. 1. p. 150.*

Found in the mines of *Hercynia*, and contains sulphur, copper, silver, iron, arsenic, and lead.

*hercynicum.* Hardish, with a dull lustre and dark grey colour.

*Westrumb chem. annal. 1789. 2. p. 527.*

Found in the mines of the *Harz*, and contains a considerable portion of copper, some antimony and sulphur, a little iron, a very small quantity of silver, and neither arsenic nor lead.

*dalicum.* With metallic lustre, of a steel-grey colour, and red streak.

Argentum arsenico, &c. *Wall. syst. 2. p. 238. n. 7. a.*

Found in the mines of *Sweden* and *Saxony*, and contains iron 24, copper 13 per cent. besides a little antimony and silver.

*fulvum.* Yellow, with metallic splendour, emitting sulphurous flames and vapours when thrown on hot coals.

*Mundic.*

Cuprum fulvum. *Syst. nat. xii. 3. p. 144. n. 4.*

Cupr. sulph. et ferro. *Wall. syst. 2. p. 282. n. 9.*

Copper pyrites. *Kirwan miner. 2. p. 140.*

Copper pyrites. *Thomson chem. 4. p. 39.*

Sulphuret of copper. *Sowerby Brit. min. t. 77, 78.*

The most common ore in the mines of *Cornwall*, *Ireland*, *Siberia*, *Hungary*, *Sweden*, &c. in innumerable varieties and proportions, massive, disseminated or crystallized: colour light yellow or greenish-yellow, sometimes verging on the steel-grey, when tarnished by the air often variegated with gold-yellow, blue, green or red: texture even or imperfectly conchoidal, rather soft: it deflagrates with nitre, does not effloresce by exposure to the air, nor effervesce with nitrous acid: before the blowpipe it decrepitates, gives a greenish sulphurous smoke, and melts into a black globule which

gradually takes the colour of copper: it is composed of copper and sulphur with a little iron: it tinges borax green: specific gravity 4,160.

*Campanarum.* Hardish, ponderous, with metallic lustre, of a bluish-steel colour.

*Molin Natur. Chil. p. 74.*

*Klaproth schreb. Naturf. Berl. 7. p. 160.*

Bell metal ore. *Kirwan miner. 2. p. 153.*

Bell metal. *Schmeisser miner. 2. p. 151.*

Found in *Chili*, and in *Cornwall* near *Whealrock*, and consists of copper and tin pyrites, with sometimes a little arsenic,

*aurichalceum.* Of the colour and lustre of brass, malleable.

*Molin. Natur. Chil. p. 77.*

Brass Copper ore. *Kirwan mineral. 2. p. 153.*

Found near the river *Laxa* in *Chili*, and consists of copper pyrites, and blende or sulphuret of zinc.

*cornubicum.* Grey, composed of sulphur, zinc, tin, and arsenic.

*Rafpe Ad. Petrop 3. hist. p. 77.*

Found in *Cornwall*, and is probably only a variety of the Bell metal ore.

*vitratum.* Soft, with metallic lustre, of a lead colour, easily melting before the blowpipe.

Cuprum canum. *Syst. nat. xii. 3. p. 144. n. 6.*

Cuprum sulphure miner. *Wall. syst. 2. p. 277. n. 4.*

Vitreous Copper ore. *Kirwan mineral. 2. p. 144.*

Vitreous Copper ore. *Schmeisser miner. 2. p. 143.*

Sulphuret of Copper. *Thomson chem. 4. p. 38.*

Found in *Cornwall*, *Hungary*, *Siberia*, *Bohemia*, *Austria*, *Germany*, &c. in masses, plates, threads, or crystallized in cubes, 6-sided prisms, or 4 sided double pyramids: texture compact or foliated: before the blowpipe it melts easily, exhibiting a green pearl while in fusion, which on cooling is covered with a brown crust: it deflagrates with nitre, tinges borax green, and is soft enough to be cut with a knife: effervesces with nitric acid, turning the solution green: specific gravity from 5,432 to 5,565: the compact kind contained copper 78,50. sulphur 18,50. iron 2,25. silica 0,75. the foliated contained copper 50, sulphur 20, iron 25. *Klaproth.*

*phlogisticum* Black, burning slowly with a flame, and at last consuming to ashes,

Minera cupri phlogistica. *Cronst. miner. 160. 6. 1.*

Cuprum facie Carbonaria. *Wall. syst.* 2. p. 285. n. 13.

Combustible Copper ore. *Kirwan miner.* 2. p. 153.

Bituminous Copper. *Schmeisser mineral.* 2. p. 149.

Pitch ore. *Thomson chem.* 4. p. 45.

Found in *Dalecarlia* in *Sweden* and in *Siberia*, and resembles a piece of coal or bituminous shif: it consists of bituminous coal or shale impregnated with oxyde of copper: the ore is extracted from the ashes with considerable difficulty.

85. FERRUM. Bluish grey, easily rusting in the air, very hard, tenacious and elastic, sonorous, exceedingly malleable, ductile, attracted by the magnet and itself convertible into the magnet, specific gravity 7,778: becoming white in the fire, then emitting brilliant sparks, and at last melting, forming a red oxyde when its filings are kept red hot in an open vessel and stirred: soluble in all acids, giving them an astringent taste and a black colour when mixed with vegetable astringents, precipitating a green powder when dissolved in sulphuric acid and mixed with potass, with the prussic acid producing a rich azure-blue.

*Iron.*

*nativum.*

Uncombined, malleable.

Ferrum nudum. *Syst. nat.* xii. 3. p. 136. n. 1.

Ferrum nativum. *Wall. syst.* 2. p. 233. n. 1.

Native Iron. *Kirwan miner.* 2. p. 156.

Native Iron. *Schmeisser miner.* 2. p. 82.

Native Iron. *Thomson chem.* 4. p. 50.

This most useful of all metals, the continual attendant on man in all his states of social existence, which to the labourer and the mechanic gives his tools, to the soldier his arms, to the sailor his compass, and to the scholar his penknife and ink, is very rarely if ever found in a native uncombined state: most of those masses which have been found in *America*, *Siberia*, &c. seem more properly to belong to the meteoric kind, as they all contain a portion of nickel; though Mr. Kirwan thinks that it has, beyond doubt, been detected at *Eibenstock* in *Sweden*, and in the mountain of *Grand Gilbert* in *Dauphiny*.

*meteoricum.* Amorphous, of a granular texture, outwardly covered with a black scoriaceous crust, internally ashy-grey mixed with minute shining particles, falling from the atmosphere.

*Philosophical Transact.* 1802. part 1. p. 174. 183.

*Thomson chem.* 3. p. 416.

Meteor. Iron. *Sowerby Brit. min.* 2. t. 101.

Found at *Wold Cottage* in *Yorkshire*, in *Scotland*, various parts of the continent, and in *America* and *Siberia*, where they have been deposited by the burbling of meteors: at first, when they fall from the atmosphere, they are said to be hot, and their descent to be accompanied with a loud explosion and hissing noise: they are found of various magnitudes from a few ounces to several tons in weight: the outer surface is rough and indented, and covered with a thin black crust, as if it were burnt; internally they are of a fine granular texture, which may be easily crumbled to pieces with the nail, of an ashy-grey colour intermixed with small shining yellow particles, and discovering an earthy smell: they are slightly magnetic, and sometimes exhibit fine veins of iron: specific gravity from 3,352. to 4,281: a piece of the *Yorkshire stone* contained in 150 parts, silica 75, magnesia 37, oxyde of iron 48, oxyde of nickel 2, leaving an excess of 12 from the absorption of oxygene during the process of analysis.  
*Howard.*

*chalybeum.* Attracted by the magnet, reducible to grains, black with a black streak, of a compact texture and common form.

*Ferrum compactissimum.* *Syst. nat.* xii. 3. p. 137. n. 4.

*Minera ferri solida.* *Wall. syst.* 2. p. 237. n. 4. a.

Found at the base of the mountain *Urdjumski* in *Siberia*, and in the mines of *Sweden*: it strikes fire with steel and is malleable after fusion: contains from 50 to 60 per cent of good iron which is convertible into the best kind of steel, and a little sulphur.

*selectum.* Attracted by the magnet, reducible to grains, black with a black streak, of a very finely granular texture and common form.

*Ferrum solidescens.* *Syst. nat.* xii. 3. p. 137. n. 8.

*Ferrum minera nigricante.* *Wall. syst.* 2. p. 437. n. 4. b.

Magnetic Iron stone. *Kirwan mineral* 2. p. 158.

Common Iron ore. *Berkenb. outl.* p. 265.

Magnetic Iron stone. *Schmeissner miner.* 2. p. 89.

Magnetic Iron stone. *Thomson chem.* 4. p. 53.

2. Falling into rhombic particles.

Ferrum partic. rhomb. *Syst. nat.* xii. 3. p. 137. n. 6.

Found in most of the iron mines of *Europe* and *America*, and yields a considerable proportion of good iron.

*commune.*

Attracted by the magnet, reducible to grains, black with a black streak, of a coarser granular texture and common form.

Ferrum nigrans. *Syst. nat.* xii. 3. p. 138. n. 10.

Minera granularis. *Wall. syst.* 2. p. 238 n. 4. c.

2. Mixed with arenaceous particles.

Ferrum granosum. *Syst. nat.* xii. 3. p. 138. n. 9.

3. With particles of steatite interspersed.

Ferrum talcosum. *Syst. nat.* xii. 3. p. 138. n. 12.

4. With calcareous particles intermixed.

Ferrum calcarium. *Syst. nat.* xii. 3. p. 138. n. 13.

5. With red micaceous spots interspersed.

Ferrum sidereum. *Syst. nat.* xii. 3. p. 137. n. 5.

6. Mixed with particles of pyrites.

Ferrum molle. *Syst. nat.* xii. 3. p. 138. n. 11.

Found in most countries containing mines of iron, and is subject to many varieties: contains a large quantity of ore and sometimes some sulphur.

*crystallinum* Attracted by the magnet, black with a black streak, in the form of crystals.

Ferrum tessellare. *Syst. nat.* 3. p. 136. n. 2.

Ferrum crystallifatum. *Wall. syst.* 2. p. 234 n. 2.

Magnetic Iron stone. *Kirwan mineral.* 2. p. 158.

Octahedral Iron ore. *Schmeisser mineral.* 2. p. 84.

Magnetic Iron stone. *Thomson chem.* 4. p. 53.

Magnetic Iron ore. *Sowerby Brit. min.* t. 54.

Found in various parts of *Britain*, *Norway*, *Sweden*, *Germany*, *Corfica*, &c. generally strongly attached to their matrix: the primitive form of the crystals is regularly 8-sided, or cubical, or in 6-sided prisms terminated by 3 quadrangular faces: colour greyish-black or grey with more or less of a metallic lustre, and they give a black powder: specific gravity from 4,200. to 4,939.

*glareosum.* Attracted by the magnet, black with a black streak, in the form of sand.

Arena ferrea. *Syst. nat.* xii. 3. p. 199. n. 13.

Ferrum in form. arenæ. *Wall. syst.* 2. p. 255. n. 18.

Magnetic sand. *Kirwan mineral.* 2. p. 161.



Magnetic iron sand. *Schmeißer miner.* 2. p. 90.

Magnetic sand. *Thomson chem.* 4. p. 53.

Found in *Italy* at the base of volcanic mountains, in the rivers and on the shores of *Great-Britain*, *Siberia*, *Greenland*, *Bohemia*, *Jamaica* and *India*, and seems to be the fragments of other ores washed down and comminuted by torrents and the waves of the sea: the grains are obtusangled, deep glittering, very hard and magnetic, of a conchoidal fracture, not altered by the blowpipe, melting into a black glass with potash and into a green glass with microcosmic salt: specific gravity 4,600. they probably contain some silica.

*hepaticum.* Attracted by the magnet, liver-brown with a black streak, striking fire with steel, reducible to somewhat cubical fragments.

Found in the alps of *Lapland*, compact.

*nitens.* Attracted by the magnet, compact, black with a red streak, reducible to cubic shining fragments.

*Cronst. min. secl.* 211. 2. 3.

Found in the mines of *Arendal* in *Norway*.

*rhombicum.* Attracted by the magnet, compact, with a red streak, reducible to rhombic fragments.

*Ferrum decussatum.* *Syst. nat.* xii. 3. p. 139. n. 14.

Found in the mines of *Bitzburgen* in *Sweden*.

*succinum.* Attracted by the magnet, compact, black with a red streak, breaking into indeterminate fragments.

*Cronst. mineral secl.* 211. 2. 1.

Found in the mines of *Sweden*.

*lamellosum.* Attracted by the magnet, black with a red streak, lamellar.

*Ferrum squamosum.* *Syst. nat.* xii. 3. p. 139. n. 16.

*Minera lamellosa.* *Cronst. min.* 211. 2. 4.

Lamellated iron ore. *Schmeißer miner.* 2. p. 89.

Found in *Norway*, *Russia*, *Siberia*, *India* and *Mexico*, iron-black, solid, shining, with a lamellar texture: contains a large proportion of iron.

*Magnes.* Magnetic, compact, of a common form.

*Ferrum attractorium.* *Syst. nat.* xii. 3. p. 142. n. 27.

*Ferum polos ostend.* *Wall. syst.* 2. p. 235. n. 3.

Magnetic iron stone. *Kirwan min.* 2. p. 158.

Magnet or loadstone. *Schmeißer miner.* 2. p. 88.

Magnetic iron-stone. *Thomson chem.* 4. p. 53.

Found in the mines of *Denmark, Sweden, Norway, Lapland, Siberia, Bohemia* and *Peru*, in masses, plates, grains, or 8-sided crystals: colour generally iron-black, brown, steel-grey, or bluish: it is hard, brittle, with commonly a little lustre, and breaks into indeterminate obtusangled fragments: it often contains above 70 per cent. of iron.

*granulare.* Magnetic, of a granular texture and common form.

*Magnes granularis.* *Wall syst.* 2. p. 235. n. 3. b.

Magnetic iron stone. *Schmeisser miner.* 2. p. 89.

Found in the iron mines of *Sweden*, and resembles the loadstone except in its texture.

*fibrosum.* Magnetic, of a fibrous texture and common form.

*Karsten Leske mineral* 1 p. 442

Fibrous magnetic iron stone. *Kirwan miner.* 2. p. 160.

Fibrous magnetic iron stone. *Schmeisser min.* 2. p. 90.

Found in *Sweden*, of a colour between steel grey and bluish-grey, with a little lustre, opaque, soft, brittle, breaking into indeterminate and not very obtusangled fragments: it gives a dark bluish streak, and consists of fine straight fascicled fibres.

*squamosum.* Magnetic, of a lamellar texture and common form.

*Karsten Leske mineral.* 1. p. 446.

*Danz chem. annal.* 1785. 2. p. 426.

Lamellated magnetic iron stone. *Schmeisser* 2. p. 89.

Found in the mines of *Norway, Siberia*, and *Russia*, solid, shining, of an iron-black colour, and giving a reddish streak: it consists of thick straight plates.

*subtetraedrum.* Magnetic, black, in the form of crystals.

Found in the mines of *Norway* and *Saxony*, generally in a matrix of gneiss and accompanying copper pyrites: its crystals are generally double 4-sided pyramids, or 4 sided obliquangled prisms, or in 6-sided wedge-like figures, one end terminating in an acicular point, the other in an irregular 8-sided pyramid.

*basalticum.* Magnetic, brownish-red, formed of slender columns adhering to each other and which are generally incurved.

*Hacquet schr. berl. natur.* 4. p. 13. t. 3. f. 1, 2.

*Danz chem. annal.* 1785. 2. p. 424.

Columnar iron ore. *Kirwan miner.* 2. p. 176.

Columnar iron ore. *Thomson chem.* 4. p. 60.

Found in *Bohemia, Franconia, &c.* generally in large strata, consisting of columns which are easily separable, sometimes jointed, and with their surface rough: it slightly stains the fingers, feels dry, adheres to the tongue, sounds hollow when struck, blackens before the blowpipe, effervesces with borax and gives it an olive-green and blackish tinge.

*micaceum.* Not magnetic, iron-grey; shining, of a lamellar texture.

Ferrum micaceum. *Syst. nat.* xii. 3. p. 139. n. 18.

Ferrum minera micacca. *Wall. syst.* 2. p. 242. n. 8.

Micaceous iron ore. *Kirwan min.* 2. p. 184.

Micaceous iron ore. *Schmeisser mineral.* 2. p. 87.

Brown scaly iron ore. *Thomson chem.* 4. p. 57.

Foliated oxide of iron. *Sowerby Brit. min.* t. 64.

Found in *Wales, Scotland, Cornwall, &c.* in *Siberia, Lapland, Sweden, Hungary,* and other parts of *Europe*, massive or disseminated, variously grouped, or crystallized in small 6-sided tables: colour bright iron grey, bluish, or approaching to black: the foliations are brittle, straight or incurved, and rarely present a granular concretion: it feels somewhat greasy, and does not stain the fingers: specific gravity from 4,500. to 5,070.

*speculare.* Not magnetic, compact, of a steel-grey colour and lustre, with a red streak, internally specular.

Ferrum minera grisea. *Wall. syst.* 2. p. 239. n. 6.

Specular iron ore. *Kirwan miner.* 2. p. 162.

Specular iron ore, or mirror ore. *Schmeisser* 2. p. 86.

Specular iron ore. *Thomson chem.* 4. p. 54.

Crystallized oxide of iron. *Sowerby Brit. min.* t. 66.

2. Reddish, striking fire with steel; solid, striate in a rhombic manner.

Ferrum rubricans. *Syst. nat.* xii. 3. p. 140. n. 20.

3. Reddish, with erect crystallized foliations in the hollow interstices.

Ferrum cellulosum. *Syst. nat.* xii. 3. p. 140. n. 21.

Crystallized oxide of iron. *Sowerby Br. min.* t. 66.

Found in the mines of *Lancashire*, in the isle of *Elba, Germany, France, Russia, &c.* massive, disseminated, or crystallized: colour dark-grey or inclining to brown, the surface often tarnished and exhibiting various iridescent colours: crystals cubic or rhombic, or in flat 6 or 8-sided tables, or in prisms and pyramids, often cellularly disposed in thin erect angular plates: it gives a dark-red streak, and blackish-red powder;

is hard, but not brittle: specific gravity from 5.011. to 5.218: contains iron 66,1. oxygene 21,2. water and carbonic acid 10,7. lime 2,0. *Musket.*

*rubricosum.* Not magnetic, red, lamellar, shining internally, very soft, greasy to the touch and staining the fingers, of a common form.

Ferrum rubicans. *Syst. nat.* xii. 3. p. 141. n. 33.

Ferrum ochraceum. *Wall. syst.* 2. p. 248. n. 13.

Red scaly iron ore. *Kirwan mineral.* 2. p. 172.

Red iron glimmer. *Schmeissner mineral.* 2. p. 92.

Red scaly iron ore. *Thomson chem.* 4. p. 56.

Found in *Wales, Sweden, Saxony, Hungary, &c.* most commonly incumbent upon other ores and minerals: colour cherry-red, often passing into steel grey or brown: texture foliated, with the scales generally incurved with distinct fine grained concretions: it is soft, friable, feeling unctuous to the touch and strongly staining the fingers: when heated it reddens, but before the blowpipe blackens and gives an olive green tinge to borax.

*Hæmatites.* Not magnetic, fibrous, hardish, opaque, with a red or yellow streak.

1. Black, combined with manganese.

Ferrum minera nigric. *Wall. syst.* 2. p. 245. n. 10.

Black iron stone. *Kirwan mineral.* 2. p. 167.

Black iron stone. *Schmeissner miner.* 2. p. 98.

Black iron ore. *Thomson chem.* 4. p. 58.

2. Brown with a yellowish-grey streak.

Hæmatites nigrescens. *Cronst. mineral.* 202.

Brown Hæmatites. *Kirwan mineral.* 2. p. 163.

Brown fibrous iron stone. *Schmeissner* 2. p. 97.

Brown Hæmatites. *Thomson chem.* 4. p. 58.

Radiated oxide of iron. *Sowerby Br. min.* 1. 60.

3. Red, with a red streak.

Hæmatites ruber. *Cronst. min.* 203.

Ferrum minera rubra. *Wall. syst.* 2. p. 145. n. 11.

Ferr. rubric. glandul. *Syst. nat.* xii. 3. p. 140. n. 22.

Bloodstone. *Berkenhout Outl.* p. 264.

Red Hæmatites. *Kirwan mineral.* 2. p. 2. p. 168.

Hæmatites, Bloodstone. *Schmeissner* 2. p. 94.

Red Hæmatites. *Thomson chem.* 4. p. 56.

Radiated oxide of iron. *Sowerby. tab.* 56. 113.

4. Yellow, with a yellow streak.

Hæmatites flavus. *Cronst. min.* 204. 2.

Ferrum minera flava. *Wall. syst.* 2. p. 247. n. 12.

Found in various parts of *England* and *Scotland*, particularly in *Lancashire*, in *Russia*, *Siberia* and other parts of the continent, massive, disseminated, nodular, botryoidal, tabular, cellular, tubular, or stalactitical; hard, compact, fibrous or radiated, with the fragments usually splintery or wedge shaped; the fibres are stellate, or sometimes in distinct columns: colour varying from black to yellow, with the surface often variegated, and sometimes marked with shrublike ramifications: specific gravity from 3,423. to 5,005.

*compactum*. Not magnetic, compact, opaque, with a red or yellow streak.

Hæmatites solidus. *Wall. syst.* 2. p. 244. n. 10--12.

Compact red iron stone. *Kirawan miner.* 2. p. 170.

Compact red iron stone. *Schmeisser min.* 2. p. 93.

Compact red iron ore. *Thomson chem.* 4. p. 56.

Found in *Lancashire*, *Siberia*, *Saxony*, *Bohemia*, &c. massive, disseminated, or variously imitative, sometimes forming beds or veins: colour between brownish-red and steel-grey: fracture even or uneven, sometimes imperfectly flaty or conchoidal: it stains the fingers, blackens before the blowpipe, and gives a yellowish-green tinge to borax: specific gravity 3,503.

*spatosum*. Not magnetic, lamellar, effervescing with acids, crackling and blackening before the blowpipe, breaking into rhomboidal fragments.

Ferrum spatosum. *Syst. nat.* xii. 3. p. 141. n. 26.

Ferrum calc. lapid. inhær. *Wall. syst.* 2. p. 251. n. 16.

Sparry iron ore. *Kirawan miner.* 2. p. 190.

Spatous iron stone. *Schmeisser min.* 2. p. 99.

Sparry iron ore. *Thomson chem.* 4. p. 62.

Pearl spar. *Sowerby Brit. min. tab.* 19.

Spithose iron ore. *Sowerby Brit. min. t.* 62, 63.

Found in various parts of *Great-Britain* and *Europe*, sometimes massive, or disseminated, or in small crystals: colour when fresh white, but gradually tarnishing to red, brown, yellow, bluish, or variegated: streak grey or whitish: fragments rhomboidal, with often a perlaceous or fatty lustre: it is soft and can easily be scraped with a knife, soluble with some effervescence in acids, and decrepitates and becomes blackish and magnetic before the blowpipe: specific gravity from 3,600. to 3,810. contains iron 38, carbonate of lime 38, manganese 24. *Bergman*.

*siliceum*. Not magnetic, striking fire with steel.

Sinople. *Cronst. mineral.* 54. 1. 65.

Found in the mines of *Hungary* and the *Harz*, and consists of oxyde of iron, hornstone, quartz, and Jasper, and sometimes a small portion of gold: it frequently appears eroded.

*argillaceum* Soft, opaque, without lustre, dry.

Argillaceous iron stone. *Kirwan miner.* 2. p. 173.

Argillaceous iron stone. *Schmeisser min.* 2. p. 102.

Argillaceous iron ore. *Thomson chem.* 4. p. 59.

Argillaceous iron ore. *Sowerby Brit. min.* t. 61, 106, 107.

Found in various parts of *Great-Britain*, in *Italy*, *Saxony*, *Germany*, *Bohemia*, &c. in detached lumps or forming strata, fistular, cellular, or variously imitative: colour reddish or yellowish grey, or various shades of brown or black, with the surface often uneven and bumpy: adheres to the tongue, and has a compact, even or uneven, flat or splintery fracture: it generally gives a reddish-yellow streak, and has an earthy smell when breathed on: specific gravity from 2,673. to 3,471: it is composed of oxyde of iron, alumina, lime, and silica, in various proportions.

*Ochra.* Not magnetic, without lustre, opaque, friable.

Ochra ferri. *Syst. nat.* xii. 3. p. 192. n. 1, 2.

Ferrum acido solut. *Wall. syst.* 2. p. 258, 259.

Iron ochre. *Kirwan miner.* 2. p. 167.

Red ochre. *Kirwan miner.* 2. p. 171.

Red crayon. *Thomson chem.* 4. p. 59.

Found in every country abounding in iron ores, sometimes in solution in waters impregnated with iron, sometimes compact or hardish, rarely fibrous in a stellate manner: colour various shades of red or yellow passing into brown by exposure to the air: streak red or yellow: it adheres to the tongue, stains strongly, and is principally employed in drawing and writing.

*cærulea.* Not magnetic, friable, earthy, without lustre, becoming blue by exposure to the air and brownish in the fire, changing its colours in a solution of soda.

Ferrum cæruleum. *Wall. syst.* 2. p. 260. n. 33.

Blue martial earth. *Kirwan miner.* 2. p. 185.

Blue earthy iron ore. *Schmeisser miner.* 2. p. 107.

Blue iron earth. *Thomson chem.* 4. p. 67.

Azure iron ore. *Sowerby Brit. min.* t. 10.

Found in many parts of *England* and *Scotland*, *Siberia*, *Russia*, *Sweden*, *Norway*, *Poland*, *Germany*, &c. in marshy grounds at various depths, generally in an earthy state and without any regular shape, adhering to the stones and pebbles which surround it: colour generally whitish when first taken from the soil, and becoming gradually of a fine blue by exposure

to the air, though according to Mr. Sowerby, it is sometimes blue when fresh gathered and first broken: it stains strongly, feels harsh to the touch, is moderately heavy, and dissolves readily in acids: when heated on red hot coals it inflames and leaves a red powder; before the blowpipe it becomes reddish brown, and melts into a black bead, and tinges borax of a dark yellow: in water it preserves its colour, but becomes black in oils: it is by Klaproth considered as a phosphat of iron.

*smaltinum*. Not magnetic, hardish, earthy, opake, without lustre, blue, not changing its colour in a solution of soda, becoming grey in the fire.

*Klaproth. jebv. berl. naturf.* 10. p. 91.

Found near *Vorau* in *Hungary*, forming together with quartz and white micaceous gneiss a vein from a quarter to half an inch thick: when first dug from the mine it is of a fine blue colour, but loses all its colour when thrown on red hot cinders: with borax it melts into a pale yellow transparent glass, with phosphoric acid a colourless one: it is not like the last soluble in acids: it consists of oxyde of iron, alumina, and silica,

*subaqueosum*. Not magnetic, without lustre, opake, of a dull colour, humid.

*Tophus Tubalcaini*. *Syst. nat.* xii 3. p. 187. n. 5.

*Ferrum limosum*. *Wall. syst.* 2. p. 255. n. 19.

Lowland iron ore. *Kirwan miner.* 2. p. 179

Subaqueous iron ore. *Schmeisser miner.* 2. p. 106.

Bog iron ore. *Thomson chem.* 4. p. 61.

Found in *Great-Britain* and various parts of *Europe*, in low swampy situations, stagnant lakes or in brook-waters, sometimes massive, but commonly in detached lumps of various shapes, as placentiform, flat and rounded, globular or kidney-form when it is called *Eagle stone*, granular, or pisiform, generally perforated, fistular, or spongy: colour brown with various shades of red, green, yellow, blue or grey: texture earthy, brittle: it consists of oxyde of iron combined with phosphoric acid and alumina.

*viride*. Of a green colour, shining, dissolving in acids with difficulty, friable.

*Hoffmann Berg. Journ.* 11. 1. p. 397.

Green martial earth. *Kirwan min.* 2. p. 188.

Green iron earth. *Schmeisser miner.* 2. p. 108.

Found at *Schneeberg* in a matrix of quartz and clay, compact, solid, or like a corroded stone, oftener investing or incumbent, and seldom indurated: colour various shades of green

or yellowish-green, with a dull lustre: it stains the fingers, and blackens when strongly heated: with borax it easily melts into a yellowish-brown opake glass with some black spots: it is supposed to consist of alumina, silica, manganese, and from 10 to 12 per cent. of iron.

*arsenical.* Grey or greenish, not magnetic, emitting arsenical vapours when thrown on red hot coals.

*Proust. annal. de chim.* 1. p. 195.

*Philosoph. Transact.* 1801. p. 190.

*Klaproth. observations.* p. 29.

Arsenicated iron ore. *Kirwan miner.* 2. p. 189.

Arsenical iron ore, Mispickel. *Schmeisser* 2. p. 109.

Arseniat of iron. *Thomson chem.* 4. p. 63.

Arseniate of iron. *Sowerby Brit. min.* t. 87. 97.

Found in the copper mines of *Cornwall* and in *Spain*, in small pieces or generally crystallized in cubes: colour various shades of grey or green: its fracture is granular, and it has no transparency: specific gravity from 3,000 to 3,400: it contains arsenic acid, oxides of iron and copper, silica and water in various proportions.

*sulphuratum* Opake, emitting sulphurous flames and vapours when thrown on hot coals.

Pyrites aquosus. *Syst. nat.* xii. 3. p. 116. n. 7.

Sulph. ferro mineralis. *Wall. syst.* 2. p. 133. n. 7.

Sulphuret of iron. Iron pyrites. *Sowerby tab.* 29. 99. 104, 105.

This combination of iron and sulphur has been already described under the genus Sulphur.

*phlogisticum* Opake, of a dusky colour, inflammable.

Minera ferri phlogistica. *Cronst. miner.* 160. 6. 2.

Bituminous iron ore. *Schmeisser miner.* 2. p. 109.

Found in *Hungary* and *Sweden*, in external appearance resembling a piece of coal: texture friable, or rather firm, or fixed: it quickly kindles and burns with a light flame, losing something of its weight: consists of bitumen with a little iron, and gives about 30 per cent of the latter.



**86. STANNUM.** Silvery-white, tarnishing in the air, softish, very malleable and ductile, not sonorous, flexible and crackling when bent, specific gravity 7,291: easily melting, and the surface soon becoming covered with a grey powder which gradually changes to yellow if the heat be continued, in a very violent heat running into a fine white glass: soluble in acids but not totally in the nitric, giving the solution a bitter taste, and forming a purple precipitate when mixed with a solution of gold. *Tin.*

*nativum.*

White, unalloyed, with metallic lustre.

*Stannum nudum. Syst. nat. xii. 3. p. 236. n. 1.*

*Philosoph. Transact. 56. p. 35. 305. & 69. 1. p. 47.*

Native tin. *Berkenhout outl. p. 261.*

Native tin. *Kirwan mineral. 2. p. 196.*

Native tin. *Schmeisser mineral. 2. p. 158.*

Found, though very rarely, in *Cornwall* and the *Scilly islands*, imbedded in quartz, and generally accompanied by tin spar.

*aureum.*

Of a gold colour, easily burning with a blue flame and leaving a white oxyde.

*Bergman nov. Act. Stockh. 2. 1781. p. 328.*

*Gerhard Grund. mineral. p. 250.*

Found near *Gieren* in *Silesia*, intermixed with other fossils, in scarce and small lumps.

*pyriticosum.*

Yellowish steel-grey, with metallic lustre, of a radiated texture, emitting sulphurous vapours when burnt, and leaving a white oxyde.

*Bergman nov. Act. Stockh. 2. 1781. p. 328.*

*Gerhard Grund. mineral. p. 250.*

Tin pyrites. *Kirwan miner 2. p. 200.*

Sulphurised tin. *Schmeisser mineral. 2. p. 162.*

Sulphuret of tin. *Thomson chem 4. p. 67.*

Found at *Sr. Agnes* in *Cornwall*, where there is a vein nine feet wide, and 20 yards below the surface: colour yellowish-grey, passing into the steel-grey: texture even or minutely conchoidal, or radiated or imperfectly foliated: it is soft, very brittle, and melts before the blowpipe with a sulphurous smell into a black button, and deposits a bluish-white oxyde on the charcoal: specific gravity 4,350. contains tin 34, copper 36, sulphur 25, iron 3, earth 2. *Klaproth.*

*mineralisatum.* Shining, opaque, milk-white, with a yellowish-white streak.

*Gerhard Grund. mineral. p. 250.*

Native tin spar. *Schmeisser miner. 2. p. 159.*

Found near *Gieren* in *Silesia*, and in *Cornwall*, of a common form, or in pyramids or octohedrons: texture frequently fibrous or lamellar: when fused with borax it produces a milk-white glass: specific gravity 6,007.

*spatosum.* Whitish or brown, lamellar, diaphanous, transparent or semitransparent.

*Stannum spatosum. Syst. nat. xii. 3. p. 131 n. 4.*

*Stannum minera spathiforme. Wall. syst. 2. p. 322 n. 5.*

Brown tin stone. *Schmeisser mineral. 2. p. 160*

Found in *Cornwall*, *Bohemia*, and *Saxony*, and is often confounded with tungsten: it dissolves in acids and melts with considerable difficulty, and is sometimes so hard as to strike fire with steel: its surface can be scraped with a knife: it is found in masses and sometimes crystallized in double 4-sided pyramids: colour whitish, various shades of brown with often a mixture of red: specific gravity 6,900. it contains from 70 to 80 per cent of tin.

*lignum.* Pale wood-colour marked with alternate paler striæ, fibrous in a stellate manner, striking fire with steel, separating into layers, breaking into wedge-form fragments.

*Brunnich Act. Stockh. 39. 1778. p. 320.*

*Holzzin. Klaproth sch. Berl. nat. 7. p. 169. 180.*

Wood tin ore. *Kirwan miner. 2. p. 198.*

Stream tin. *Schmeisser mineral. 2. p. 161.*

Wood tin. *Thomson chem. 4. p. 69.*

Found in *Cornwall*, in small rounded pieces with the surface commonly rough, or in indeterminate fragments: colour light brown with shades of a lighter colour, having the appearance of a piece of knotted wood: texture finely fibrous, with the fibres generally diverging on one side: it is opaque, hard, dissolving slowly in acids, and melting with great difficulty, decrepitating when red hot: specific gravity from 5,800. to 7,000. it contains about 63 per cent of tin.

*amorphum.* Compact, opaque, of a common form and dusky colour, with a light grey streak.

*Stannum amorphum. Syst. nat. xii. 3. p. 130. n. 3.*

*Stann. arsenico et ferro. Wall. syst. 2. p. 321. n. 4.*

Common tin stone. *Kirwan miner. 2. p. 197.*

Brown tin stone. *Schmeisser miner. 2. p. 260.*

Tinstone. *Thomson. chem. 4. p. 68.*

Found in *Cornwall, Devonshire, the Scilly islands, India, Bohemia, Saxony, Silesia, &c.* in masses or rounded pieces: colour dark or blackish-brown with various shade of yellowish or ashy-grey or brownish red: it is very hard, decrepitates before the blowpipe, and on charcoal is partly reduced: it tinges borax white: specific gravity from 6,900. to 6,970. contains tin 77,50. oxygene 21,50. iron 00,25. silica 00,75. *Klaproth.*

*crystallinum* Compact, opaque, ponderous, with a light grey streak, in the form of crystals.

Stannum tesseriis cryst. *Syst. nat.* xii. 3. p. 130. n. 1, 2.

Stann. arsenico cryst. *Wall. syst.* 2. p. 320. n. 2, 3.

Common tinstone. *Kirwan miner.* 2 p. 197.

Brown tinstone. *Schmeisser miner.* 2. p. 160.

Tinstone. *Thomson chem.* 4. p. 68.

Oxygenized tin. *Sawerby Brit. miner.* t. 12. 80. 81. 82. 85.

Found in all tin mines, sometimes very small and clustered together, sometimes in larger regular crystals: colour black or brown with generally a shining surface, rarely red, yellowish, or greenish: they are found interspersed in quartz, fluor, or other matrices, or loose among the soil or sand: the crystals are very irregular, the primitive form of which is supposed to be a cube, but they commonly occur in the form of double or single 4-sided pyramids with the edges bevelled.

87. PLUMBUM. Bluish-white gradually blackening in the air, soft, very malleable, a little ductile and tenacious, not sonorous, staining the fingers of a bluish colour, specific gravity 11,352: easily melting exhibiting iridescent colours on the surface during liquefaction, and becoming first a white, then a grey, then a yellow, and lastly a red oxyde, all of which are easily convertible into glass: soluble in all acids and giving the solution a sweetish taste, precipitating a yellow powder if dissolved in nitric acid and potash be added to the solution. *Lead.*

*nativum.* Uncombined.

Plumbum nudum. *Syst. nat.* 1. p. 180. n. 1.

Plumbum nativum. *Wall. miner.* 272.

Native lead. *Kirwan miner.* 2. p. 202.

Native lead. *Schmeisser mineral.* 2. p. 168.

Found in *Monmouthshire*, *Poland*, and *Silesia*: though it is much doubted whether lead is ever found in its perfect metallic state.

*ochraceum.* Pulverulent, without lustre, totally soluble in nitric acid with effervescence, easily reducible to a metallic state on charcoal.

Ochra plumbi. *Syst. nat.* xii. 3. p. 193. n. 7.

Plumbum terreum. *Wall. syst.* 2. p. 313. n. 13.

Earthy lead ore or ochre. *Kirwan* 2. p. 205.

White opake lead ore. *Schmeisser* 2. p. 171.

Earthy lead ore. *Thomson chem.* 4. p. 73.

Found in the various lead mines of *Great-Britain*, *Saxony*, *Germany*, &c. in a loose earthy state, and generally seated on galena: colour white, grey, red or yellow: it becomes red when exposed to a sufficient heat, and contains a considerable portion of carbonic acid gas: it yields from 60 to 80 per cent. of lead.

*terreum.* Indurated, without lustre, earthy internally, soluble in nitric acid with effervescence.

Plumbum terrestre. *Wall. syst.* 2. p. 210. n. 10.

Earthy indurated lead ore. *Kirwan* 2. p. 205.

White opake lead ore. *Schmeisser* 2. p. 171.

Earthy lead ore. *Thomson chem.* 4. p. 73.

Found with the last, of which it seems only an indurated variety, in larger or less masses intermixed with other ores and fossils, in various shades of white, grey, blue, yellow, red or brown.

*micaceum.* Greasy to the touch, lamellar, of a silvery colour and lustre.

*Rose scbr. berl. naturf.* 8. p. 204.

Found in the mines of the *Harz*, and consists of numerous plates incumbent on each other.

*vitreum.* Semitransparent, brittle, of a glassy texture and lustre, and common form.

*Woulf. Philos. Trans.* 66. 2. n. 43.

Glass of lead. *Kirwan mineral.* 2. p. 204.

Glass of lead. *Schmeisser mineral.* 2. p. 176.

Found in *Somersetshire*, and the lead hills in *Scotland*, in *France*, *Saxony*, *Siberia*, *Hungary*, &c. colour white, grey, or yellowish-green: texture conchoidal or splintery: it does not effervesce with nitric acid.

*spatosum.* Shining externally and internally, soft, white, decrepitating in the fire, effervescing with acids, generally in the form of crystals.

Plumb. fragm. spatof. *Syst. nat.* xii. 3. p. 135. n. 9.

Plumbum lapideum. *Wall. syst.* 2. p. 307. n. 6.

White lead ore. *Kiravan mineral.* 2. p. 203.

White carbonate of lead. *Schmeisser* 2. p. 172.

Carbonat of lead. *Thomson chem.* 4. p. 74.

Carbonate of lead. *Soaverby min.* t. 89, 90, 91.

Found in various parts of *Great-Britain* and *Ireland*, in *Burgandy*, *Austria*, *Saxony*, *Hungary*, &c. rarely in a globular or cellular form or disseminated, but most commonly crystallized in rectangular 8 sided prisms with obtuse pyramids variously truncated, or in tables or various forms: colour silvery or pale white with sometimes a silky lustre, or tinged with brown, greenish or yellowish: texture lamellar or conchoidal, of the crystals often fibrous: it is soft enough to be cut with a knife, and is soluble in fat oils: when heated it decrepitates, then turns yellow and afterwards red: before the blowpipe it is quickly reduced, and blackens with sulphurated volatile alkali: specific gravity from 6,250. to 6,920. contains oxyde of lead 82. carbonic acid 16. *Klaproth.*

*Lyalinum.* Transparent, effervescing with nitric acid, soft, decrepitating on red hot coals, of a glassy lustre, in the form of crystals.

Murio-carbonat of lead. *Thomson chem.* 4. p. 75.

*Bournon*, *Nicholson's Journ.* 4. p. 220.

Found in the mines of *Derbyshire* and the *Harz*, in crystals the primitive form of which is a cube, often lengthened, with the edges generally truncate and replaced by small planes: colour from a clear transparent white to a pale straw yellow, with a lustre much exceeding that of the last: texture glassy, resembling that of precious stones: it is soft enough to be scratched by carbonate of lead: specific gravity 6,065. contains oxyde of lead 85, muriatic acid 8, carbonic acid 6. *Chenevix.*

*flavum.* Yellow, in the form of crystals, soft, decrepitating before the blowpipe, soluble in muriatic and sulphuric acids and giving a blue colour to hot sulphuric acid.

Yellow molybdenated lead ore. *Kiravan* 2. p. 212.

Yellow lead ore. *Schmeisser miner.* 2. p. 183.

Molybdat of lead. *Thomson chem.* 4. p. 78.

Found at the *Lead hill* in *Scotland*, in *Carinthia*, *Britany*, *Burgandy*, the *Harz*, *Austria*, &c. seldom massive, disseminated

or lamellar, but most commonly crystallized in small cubic or rhombic or 8 sided plates, rarely in 6-sided prisms: colour various shades of yellow with a waxy lustre and generally somewhat transparent, with a white streak: fracture conchoidal: before the blowpipe it decrepitates and melts into a yellowish and blackish-grey mass, producing globules of lead: specific gravity 5,486. contains oxyde of lead 64,42. molybdic acid 34,25. *Klaproth*.

*virens.*

Greenish, ponderous, breaking into indeterminate fragments and reducible to a yellow powder, nearly soluble in hot nitric acid without effervescence, melting before the blowpipe and crystallizing on cooling.

Plumbum crystallis, &c. *Syst. nat.* xii. 3. p. 134. n. 7.

Plumbum terrestre. *Wall. syst.* 2. p. 308. n. 7.

Phosphorated lead ore. *Kirwan min.* 2. p. 207.

Phosphorated lead ore. *Schmeisser mineral.* 2. p. 182.

Phosphat of lead. *Thomson chem.* 4. p. 77.

Phosphate of lead. *Sowerby Br. min.* t. 84.

Found in the lead mines of *Great-Britain, New Spain, Siberia, Bohemia, Germany, Carinthia, &c.* massive, disseminated, imitative, or crystallized in 6 sided columns variously modified: colour various shades of green, with often a mixture of yellowish, greyish or reddish brown, shining, semitransparent, with a greenish-white streak and yellowish powder: before the blowpipe it melts easily, and crystallizes on cooling: in muriatic acid it is soluble and becomes decomposed: texture foliated, fracture inclining to conchoidal: specific gravity from 6,270. to 6,560. a specimen from Wanlockhead contained, oxyde of lead 80,0. phosphoric acid 18,0. muriatic acid 1,62. *Klaproth*.

*jaspideum.* Brown, hard, opaque, of a common form.

*Fichtel karpath* p. 348.

Found near *Saska* on the *Carpathic* mountains, and contains 36 per cent. of lead, and a little silver and gold.

*fuliginosum.* Black, without lustre, soiling the fingers, not totally soluble in nitric acid, emitting sulphurous flame and vapours before the blowpipe, and crystallizing on cooling.

*Laumont ap. la Meth. journ.* 1787. 1. p. 383.

Found at *Freyburg* and in *Britany*, and besides oxyde of lead and phosphoric acid contains some sulphur: it may probably be only a sulphurate of lead in a decomposing state.

*alvernium*. Greenish-yellow, without lustre, bubbling and emitting arsenical fumes before the blowpipe, and crystallizing on cooling.

*Fourcroy annal de chem.* 2. 1789. p. 29.

Arsenico-phosphorated lead. *Kirwan mineral.* 2. p. 210.

Arsenico-phosphat of lead. *Thomson chem.* 4 p. 80.

Found at *Auvergne* in *France*, in masses, or crystallized in small 6 sided prisms: colour yellowish green of various shades: fracture fibrous, striated, or conchoidal: before the blowpipe it melts easily with effervescence, emitting a white smoke and arsenical smell: specific gravity 6,846 contains arseniate of lead 65, phosphate of lead 27, phosphate of iron 5, water 3. *Fourcroy*.

*arsenicatum* Without lustre, melting before the blowpipe but not crystallizing on cooling, emitting arsenical fumes when heated to whiteness and leaving a bead of lead.

*Proust Journ de Phys.* 30. p. 394.

Arsenicated lead ore. *Kirwan miner.* 2 p. 209.

Arseniat of lead. *Thomson chem.* 4 p. 80.

Found in the mines of *Bugandy* and *Andalusia*, in quartz or feldspar, and in small masses: colour pale green or yellowish-green, with a waxy lustre: when thrown on hot coals it easily becomes white.

*duplex*. Without lustre, before the blowpipe emitting arsenical and sulphuric flame and vapours.

*Sage Journ. de phys* 1789 2. p. 53.

Found at *Auvergne* in *France*, and consists of oxyde of lead combined with the arsenical and sulphuric acids.

*vitriolatum* Whitish, without lustre, quite fixed, easily melting before the blowpipe without decrepitation or effervescence, not effervescing with acids.

*Gadolin chem. annal.* 1778. 1. p. 147.

*Proust Journ de phys* 1787 1 p. 394.

Vitriol of lead. *Kirwan mineral* 2 p. 211.

Vitrolated lead. *Schmeisser miner.* 2. p. 181.

Sulphat of lead *Thomson chem* 4. p. 76.

Found in the lead mines of *Strontian* in *Scotland*, in *Anglesea* and *Andalusia*, sometimes variously modified, but generally in very minute crystals, and mostly above the beds of galena from the decomposition of which it seems to originate: colour white or grey, more or less pellucid: fracture compact: it is partly soluble in water, and is soon reduced before the blowpipe: specific gravity 6,300. contains oxyde of lead 71,0 sulphuric acid 24,8. water 2,0. oxyde of iron 1,0. *Klaproth*.

*cerneum.*

White, without metallic lustre, easily melting before the blowpipe, and in a greater heat entirely evaporating.

*Spielman Journ. de phys.* 1774. Dec. p. 455.

*Freber n. act. petrop.* 3 p. 269.

Found in the mines of *Lothuringia* and *Bohemia*.

*Plumbago.*

With metallic lustre, easily melting with sulphurous vapour and flame, and leaving a bead of lead without any mixture of silver.

Plumb. sulphure mineralis. *Cronst miner.* 185.

Plumbum sulphure, &c. *Wall. syst.* 2. p. 305. n. 5.

Compact galena. *Kirwan miner.* 2 p. 218.

Compact galena. *Thomson chem.* 4. p. 70.

Found in the lead mines of *England* and *Scotland*, *Norway*, *Sweden*, *Spain*, *Saxony*, &c. in mass, nodular or specular: colour lead-grey, and has a brighter streak: texture compact, and generally breaks into indeterminate fragments: specific gravity 7,444. it contains merely lead combined with sulphur.

*Galena.*

Of the colour and lustre of lead, ponderous, soft, presenting granular concretions, breaking into cubical fragments, melting with sulphurous flame and vapours, and when the lead is reduced to a glassy oxyde leaving a bead of silver.

Plumbum partic. cubic. *Syst. nat.* xii. 3. p. 133. n. 3.

Plumbum argento mixt. *Wall. syst.* 2. p. 302. n. 2.

Common galena. *Kirwan mineral.* 2. p. 216.

Galena. *Schmeisser miner.* 2. p. 178.

Lead glance. *Lerkerh. outl.* p. 262.

Sulphuret of lead. *Thomson chem.* 4. p. 71.

Sulphure of lead. *Sowerby Brit miner.* t. 24.

2. Compact, foliated or fibrous, between indigo-blue and lead-grey, sometimes striate longitudinally.

Plumbum compactum. *Syst. nat.* xii. 3. p. 133.

Blue lead ore. *Thomson chem.* 4. p. 72.

Found in various parts of *Great-Britain* and the continent, particularly *Siberia*, massive, in nodules, investing, or specular, and often coated with gold or silver mica: the crystals are usually cubes, double 4-sided pyramids, 4 and 6 sided prisms, or variously modified: texture foliated, with cubical fragments: it is brittle, sometimes soft enough to be cut with a knife, and often stains the fingers: before the blowpipe it decrepitates, melts easily with a sulphurous smell, and it alternately heated and cooled will at last vanish leaving its silver behind: it is composed of various modifications of lead, sulphur, and silver: specific gravity from 7,220. to 7,587.



*ferriferum*. With metallic lustre, melting with sulphurous vapours and flame but more difficultly than galena, and if the heat be increased forming a black glass.

2. Crystallized in long prisms or pyramids.

Plumbum basalticum. *Syst. nat.* xii. 3. p. 134. n. 6.

Galena striata. *Waller miner.* 294.

Brown lead ore. *Kirawan miner.* 2. p. 222.

Brown lead ore. *Schmeisser mineral.* 2. p. 176.

Found in the mines of Sweden, sometimes massive, sometimes crystallized in clusters: besides lead and sulphur it contains some silver and iron.

*stibiatum*. Of the colour and lustre of lead, fibrous, breaking into crustose fragments.

Plumb. fibroso-striat. *Syst. nat.* xii. 3. p. 133. n. 5.

Plumbum antimonial. *Wall. syst.* 2. p. 305. n. 4.

Antimonial lead ore. *Schmeisser miner.* 2. p. 177.

Found in the mines of Siberia, Sweden, Hungary, and Spain, of a compact and striated texture, with the pieces into which it breaks either straight or incurved, and the fibres parallel or fascicled: when heated it emits sulphurous flame and vapours: besides lead and sulphur, it contains antimony and silver.

*bercynicum*. Combined with copper and antimony, a smaller proportion of iron and sulphur, and a very small quantity of silver, with metallic lustre.

Weisgilden. *Klaproth chem. annal.* 1790. 1. p. 295.

Found in the mines of Andreasburg on the Harz: contains lead 34,0. copper 16,3. antimony 16,0. iron 13,7. sulphur 10,0. silver 2,3.

*cornubicum*. Combined with antimony, a smaller proportion of copper and sulphur, and a very small quantity of iron, with metallic lustre.

Found in the mines of Cornwall, and contains oxyde of lead about 50, antimony 21, copper 14, sulphur 7, iron 2. *Klaproth*.

*subaudicum*. With metallic lustre, emitting arsenical vapours before the blowpipe.

Razoumowsky. *excurs. dans les min.* p. 15.

Found in the mines of Subaudia, and consists of oxyde of lead antimony and arsenic.

**88. NICCOLUM.** Reddish-white, hard, malleable, attracted by the magnet and itself convertible into the magnet, specific gravity 9,000: fusing with great difficulty, but assuming a green colour when heated and acquiring a purple tinge if the heat be continued, melting with borax into a glass of a hyacinth colour: soluble in all acids giving the solution a green colour, and in ammonia to which it gives a bluish-green colour.

*ochraceum.* Green, without lustre, of a common form.

Ochra cupri nickoli. *Sys. nat.* xii. 3. p. 193. n. 5.

Niccolum viride. *Wall. fyst.* 2. p. 191. n. 2.

Nickel ochre. *Kirwan miner.* 2. p. 283.

Oxide of Nickel. *Schmeisser miner.* 2. p. 218.

Nickel ochre. *Thomson chem.* 4. p. 82.

Found in *Saxony*, *Bohemia*, and *Silesia*, on the surface of other ores of nickel, in the form of powder or indurated: colour apple-green, rarely grass-green, dark green or bluish-green: has an earthy appearance and is very friable: gives an earthy smell when breathed on, and slightly stains the fingers: does not melt before the blowpipe, but gives a reddish or yellowish tinge to borax: it appears to originate from the decomposition of native nickel ore.

*metallinum.* With metallic lustre, entirely soluble in nitric acid, emitting arsenical vapours before the blowpipe.

Arsenicated nickel. *Kirwan mineral.* 2. p. 285.

Oxide of nickel. *Schmeisser mineral.* 2. p. 218.

Arseniat of nickel. *Thomson chem.* 4. p. 83.

Found in the mines of *Bohemia*, *Saxony*, and the *Harz*, in irregular masses and often mixed with sulphate of barytes: colour pale grey, with often a mixture of pale green: fracture compact, partly earthy partly splintery, with a white streak: gives an earthy smell when breathed on, and adheres slightly to the tongue: it contains some cobalt and alumina, and often sulphate of barytes, besides the arsenic acid.

*sulphuratum* With metallic lustre, not quite soluble in nitric acid, emitting arsenical vapours and sulphurous flame and vapours before the blowpipe.

Cuprum niccolum. *Syst. nat.* xii. 3. p. 146. n. 16.

Niccolum ferro et cobalt. *Wall. fyst.* 2. p. 189. n. 1.

Sulphurated nickel. *Kirwan mineral*. 2. p. 286.

Native nickel. *Schmeisser miner.* 2. p. 216.

Kupfer-nickel. *Thomson chem* 4. p. 81.

Found at *Triego* in *Cornwall*, in *Siberia*, *Sweden*, *Saxony*, *Hungary*, *Bohemia*, &c. massive or disseminated, never crystallized, in a matrix of calcareous or heavy spar, and often coated with nickel ochre: colour coppery-red with variations of reddish white or grey: texture compact; conchoidal, foliated, or striated, with often curved lamellar concentric concretions: before the blowpipe it exhales an arsenical smell, and melts into a bead which gradually darkens by exposure to the air: specific gravity 6,608. to 6,648: it frequently contains bismuth, cobalt and iron, but always a portion of pyrites.

89. ZINCUM. Brilliant white with a shade of blue, hardish, a little malleable but not ductile, slightly sonorous, of a fibrous or scaly texture, specific gravity 7,120: burning with a brilliant white flame when heated to a strong degree, and emitting light white flakes, when fused with copper giving it a brassy-yellow colour: easily soluble in acids, imparting no colour to the solution, but depriving it of its acrimony.

*ochraceum*. Powdery, white, without lustre.

*Ocra zinci*. *Syst nat.* xii. 3. p. 193.

*Zincum pulverulentum*. *Wall. syst.* 2. p. 222. n. 8.

Loose or friable zinc. *Kirwan mineral* 2. p. 233.

Found in *China*, *Sweden*, and *Carinthia*, in a loose and friable form, and sometimes effervesces with acids. In *China* it is used in the formation of the metal called *Tutenag*.

*californæ*. Compact, very soft, opaque, white, without lustre.

*Minera zinci*. *Cronst min.* 226 1 1 1. 1.

Found near *Worksworth*, in *Siberia*, *Sweden*, *Bohemia*, *Austria*, &c. of an earthy or minutely lamellar form in crystals. sometimes cellular, nodular, fistular, or variously imitative: colour white, sometimes verging to yellow or grey: it effervesces with acids, in which it is almost totally dissolved.

*vitreum*. Hard, transparent, of a glassy lustre.

Carbonate of Zinc. *Schmeisser miner.* 2. p. 195.

Carbonat of zinc. *Thomson chem.* 4. p. 87.

Found in *Flintshire* and *Somersetshire*, *Carinthia* and *Siberia*, sometimes in solid masses, sometimes stalactitical, or crystallized: colour grey, with often a tinge of blue, green or yellow: it differs from the next in not gelatinizing with acids: contains oxyde of zinc 65,2. carbonic acid 35,2. *Smithson.*

*siliceum.* White, fibrous, separating into concentric concretions, gelatinizing with acids.

Found at *Wanlock head* in *Scotland*, and differs from calamine in containing frequently one-third part of silica: all the species which contain silica are more or less electric by heat.

*spatosum.* Lamellar, diaphanous, decrepitating somewhat before the blowpipe but not emitting sulphurous vapours, of a common or globular form.

Spatous calamine. *Schmeisser mineral.* 2. p. 192.

Zinc spar. *Kirwan mineral.* 2. p. 236.

Found in *Nottinghamshire*, *Austria*, *Carinthia*, &c. colour white with often a mixture of greenish, yellowish, reddish or blackish: it always contains some silica, but not in such abundance as to cause it to strike fire with steel.

*crystallinum* Lamellar, diaphanous, decrepitating somewhat before the blowpipe but not emitting sulphurous vapours, of a crystalline form.

Zincum crystallifatum. *Syst. nat.* xii. 3. p. 125. n. 1.

Zinc spar. *Kirwan mineral.* 2. p. 236.

Spatous calamine. *Schmeisser miner.* 2. p. 192.

Found with the last, of which it is only a crystallized variety: the crystals are sometimes distinct but oftener confused, in rhomboidal 4-sided prisms or rectangular 4 or 6-sided plates, or prisms or pyramids variously modified.

*Calaminaris.* Soft, tinged with some colour, of a common form and earthy texture, opaque, without lustre, totally soluble in nitric acid.

Zincum subterreum. *Syst. nat.* xii. 3. p. 126. n. 5.

Zincum terrestre. *Wall. syst.* 2. p. 216. n. 3.

Lapis calaminaris. *Kirwan miner.* 2. p. 239.

Oxyd of zinc. Calamine. *Schmeisser miner.* 2. p. 191.

Calamine. *Thomson chem.* 4. p. 86.

Found in various parts of *Great Britain*, *New Spain*, *Poland*, *Silesia*, *Saxony*, *Bohemia*, *Austria*, &c. massive, disseminated, or variously imitative: colour greyish, greenish, yellowish, reddish, or brownish: fracture earthy, sometimes siliceous, rarely conchoidal: before the blowpipe it decrepitates but does not melt, and sometimes effervesces with acids: specific

gravity 3,434: combined with copper it forms several useful alloys: when the zinc does not exceed a fourth part of the copper it makes *Brass*, and becomes malleable and ductile: when three parts of zinc are combined with four of copper it then forms *Pinchbeck* or *Prince's metal*, of a deeper orange-colour than brass and not so malleable.

*Pseudogallena.*

With a semimetallic lustre, of a lamellar texture, emitting sulphurous flame and vapour before the blowpipe.

*Black-jack.*

Blende. *Kirwan miner. 2. p. 237.*

Sulphurized zinc. *Schmeisser miner. 2. p. 197.*

Sulphuret of zinc. *Thomson chem. 4. p. 84.*

1. Sulphur yellow with often a shade of olive-green or brownish-red, with a yellowish streak and pale yellow powder.

Yellow blende. *Kirwan miner. 2. p. 238.*

Yellow blende. *Schmeisser mineral. 2. p. 199.*

Yellow blende. *Thomson chem. 4. p. 84.*

2. Brown in different shades, with a yellowish-grey streak and brownish-grey powder.

Brown blende. *Kirwan min. 2. p. 239.*

Brown blende. *Schmeisser mineral. 2. p. 200.*

Brown blende. *Thomson chem. 4. p. 85.*

3. Black or brownish-black often passing into the blood-red, with a reddish-grey streak and brownish-black powder.

Black blende. *Kirwan miner. 2. p. 241.*

Black blende. *Schmeisser miner. 2. p. 201.*

Black blende. *Thomson chem. 4. p. 85.*

4. In a state of crystallization, with the crystals variously modified, mostly confused, and often blood-red at their tips.

Sulphuret of zinc. *Sorverby Br. min. tab. 74, 75.*

Found in various parts of *Great-Britain, Siberia, Norway, Sweden, Germany, Hungary, &c.* in various shapes and mixtures, with frequently an internal lustre: texture lamellar, the foliations of which may be easily separated: when heated it decrepitates and becomes whiter, and sometimes emits a phosphorescent light when scraped in the dark: when mixed with lead it forms the metal called *Tutenag*, and combined with tin it is an ingredient in *Pewter*.

90. **BISMUTUM.** Reddish-white, soft, brittle, composed of broad brilliant plates adhering to each other, specific gravity 9.822: easily melting and forming first a yellowish and then a red oxide, in a strong heat burning with a faint blue flame and emitting a yellow smoke, fusible with borax into a brown glass: soluble in acids, and depositing a white precipitate if its solution in nitric acid be diluted with water. *Bismuth.*

*nativum.* Unalloyed, entirely soluble in nitric acid, with metallic lustre.

*Bismutum nativum.* *Syst. nat.* xii. 3. p. 128 n. 1.

*Bismutum nativum.* *Wall. min.* 242.

Found in Sweden, France, Saxony, Württemberg, Transylvania, &c generally accompanied by cobalt ores, in a matrix of red jasper, hornstone, quartz, and heavy spar: colour white with a shade of red, with the surface often tarnished red, yellow or purple: sometimes it is crystallized in 4 sided tables or indistinct cubes, but has mostly the form of small plates lying over each other: before the blowpipe it leaves a silvery-white bead, which at last evaporates in a yellowish-white smoke: specific gravity from 9.022. to 9.570.

*ochraceum.* Friable or powdery, very soft, earthy, effervescing with acids.

*Bismutum pulverulentum.* *Cronst. mineral.* 221.

*Ochra bismuti.* *Syst. nat.* xii. 3. p. 193. n. 7.

*Bismutum pulverulentum.* *Wall. syst.* 2 p. 209. n. 6.

Flowers of Bismuth. *Berkenhout outl.* p. 266.

Bismuth ochre. *Kirawan mineral.* 2. p. 205.

Oxide of Bismuth. *Schmeisser miner.* 2. p. 210.

Bismuth ochre. *Thomson chem.* 4. p. 96.

2. Crystallized in the form of cubes or 4-sided plates.

Crystallized Bismuth ochre. *Kirawan mineral.* 2. p. 265.

Found usually accompanying other ores of Bismuth, sometimes compact or disseminated, but generally covering the surface of other ores in a loose friable form: colour yellowish-grey, passing into ashy-grey, green, or yellow.

*sulphuratum.* With metallic lustre, tin or steel-grey, not entirely soluble in nitric acid, emitting sulphurous flame and smoke when thrown on hot coals.

*Bismutum sulphure min.* *Cronst. mineral.* 221. 1.

Sulphurated Bismuth. *Kirwan miner.* 2. p. 266.

Sulphurised Bismuth. *Schmeisser miner.* 2 p. 211.

Sulphuret of Bismuth. *Thomson chem.* 4. p. 95.

1. Yellowish-white, shining, combined with arsenic and sulphur.  
Wismutum albo-flavesc. *Syst. nat.* xii. 3 p. 128. n. 2.

Wismutum arsen. *Wall. syst.* 2 p. 207. n. 3.

Arsenicated bismutic ore. *Schmeisser min.* 2. p. 213.

2. Bluish-white, laminar, combined with sulphur only.

Wismutum nitens. *Syst. nat.* xii. 3 p. 128. n. 4.

Wismutum ulph. *Wall. syst.* 2. p. 206 n. 2.

Found in the mine of *Great-Britain*, *Sweden*, *Saxony*, *Bohemia*, and *Hannover*, generally accompanied by quartz, albistus, or sparry iron ore, in flive or dispersed, feld in acicular or capillary prisms: colour from tin white to lead-grey, with the surface often iridescently tarnished: texture lamellar or radiated: specific gravity from 6,131. to 6,467. contains from 60 to 95 per cent of Bismuth.

*martialis.* Grey, with metallic lustre, not entirely soluble in nitric acid, emitting sulphurous flame and smoke when thrown on hot coals.

Wismut. lamellis cuneat. *Syst. nat.* xii. 3. p. 182 n. 3.

Wismut. sulph. et ferro. *Wall. syst.* 2 p. 208. n. 5.

Martial sulphurised Bismuth. *Schmeisser* 2. p. 212.

Found near *Gillbek* in *Norway*, of a yellowish grey appearance and radiated texture: it somewhat resembles martial pyrites, and contains iron added to bismuth and sulphur.

91. STIBIUM. Of a silvery grevish white colour and radiately lamellar texture, softish and very brittle, when rubbed between the fingers giving them a peculiar taste and smell, specific gravity 6,860: melting at a red heat, and when gradually cooled exhibiting cubical crystals on the surface; in a greater degree of heat becoming first a greyish-white oxyde, afterwards an hyacinthine glass, and lastly volatilising in white vapours: forming a golden-yellow solution in nitromuriatic acid, and depositing a white precipitate if water be poured into the solution. *Antimony.*

*nativum.* Of a tin-white lustre, melting without sulphurous or arsenical vapours.

Stannum nudum. *Syst. nat.* xii. 3. p. 123. n. 1.

Antimonii regul. nativ. *Wall. syst.* 2. p. 196. n. 1.

Native antimony. *Kirwan miner.* 2. p. 245.

Native antimony. *Schmeisser miner.* 2. p. 221.

Native antimony. *Thomson chem.* 4. p. 90.

Found in the mines of Sweden, and in Dauphiny, in irregular masses or kidney-form pieces: colour bright tin or silvery-white: texture lamellar, with straight foliations: it deflagrates with nitre, and melts and evaporates before the blowpipe leaving a white oxyde: when dissolved in nitro-muriatic acid it deposits a dark red precipitate by the addition of sulphurated ammonia: specific gravity 6,720: contains antimony 98,0. silver 1,00. iron 0,25. *Klaproth.*

*arsenical.* Of a tin-white lustre, emitting arsenical vapours when heated.

*Sage Aët. Paris.* 1782. p. 310.

Arsenicated antimony. *Schmeisser min.* 2. p. 223.

Found in Dauphiny, Hungary, and Saxony, in irregular masses: it emits only arsenical fumes when heated, and contains about 16 per cent. of antimony.

*rubrum.* Dull red, fibrous, a little shining, emitting sulphurous and arsenical vapours before the blowpipe.

Stibium rubrum. *Syst. nat.* xii. 3. p. 124. n. 4.

Antimonium rubrum. *Wall. syst.* 2. p. 199. n. 6.

Red antimonial ore. *Kirwan miner.* 2. p. 250.

Red antimonial ore. *Schmeisser min.* 2. p. 226.

Red antimonial ore. *Thomson chem.* 4. p. 93.

Found in the mines of Bohemia, Saxony, Hungary, and Transylvania, in the form of capillary crystals grouped together, often diverging in a radiate manner: texture fibrous, very soft, brittle: specific gravity 4,090: contains oxyde of antimony 78,3. sulphur 19,7. *Klaproth.*

*Argentigo.* Fibrous, leaving a silver bead before the blowpipe and emitting sulphurous vapours.

Ochra argenti, *Syst. nat.* xii. 3. p. 194. n. 14.

Argentum sulphure, &c. *Wall. syst.* 2. p. 339. n. 9.

Plumose antimonial ore. *Kirwan miner.* 2. p. 250.

Plumous antimonial ore. *Schmeisser miner.* 2. p. 227.

Found in France, Sicily, Transylvania, Bohemia, Hungary, Saxony, &c. generally on other ores or stones in the form of capillary straight or flexuous fibres which are loose or cohering, parallel or disposed in a divergent manner, and soft like wool: it is a little shining, friable, and stains the fingers: colour dark blue, grey, or white: it consists of antimony, iron, sulphur, and a little silver and arsenic.



*Stibigo.*

Fibrous, a little shining, emitting sulphurous vapours before the blowpipe, and entirely evaporating in a more violent heat.

Ochra stibii. *Syst. nat.* xii. 3. p. 194. n. 13.

Antimonium sulphure. *Wall. syst.* 2. p. 197. n. 3.

Antimonial ochre. *Kirwan miner.* 2. p. 252.

Ochre of antimony. *Thomson chem.* 4. p. 93.

Found in *Saxony, Bohemia, Hungary, Dauphiny, &c.* sometimes friable and earthy, but generally covering the surface of other antimonial ores in the form of soft downy capillary flexible fibres, which are loose or bundled together, or stellately disposed: colour blackish, grey, liver-brown, dull red, violet, greenish, straw-yellow, or variegated, rarely white: it does not melt before the blowpipe, but evaporates and deposits a white powder: with borax it effervesces and is partly reduced.

*vulgars.*

Of a steel-grey colour and metallic lustre, ponderous, emitting sulphurous vapours before the blowpipe, and at last evaporating in white vapours.

Sulphurated Antimony. *Kirwan miner.* 2. p. 246.

Grey sulphurized antimony. *Schmeisser* 2. p. 224.

Sulphuret of antimony. *Thomson chem.* 4. p. 90.

1. Compact, of a fine-grained uneven fracture, with a grey metallic streak and dark-brown earthy powder.

*Waller syst. mineral.* 2. p. 198. n. 4.

Compact sulphurated antimony. *Kirwan miner.* 2. p. 249.

Compact sulphuret of antimony. *Thomson chem.* 4. p. 91.

2. Of a foliated texture and simple fracture, with a grey metallic streak and dark-brown earthy powder.

*Galen antimonii.* *Wall. syst.* 2. p. 197. n. 2. d.

Foliated sulphurated antimony. *Kirwan miner.* 2. p. 248.

Foliated sulphuret of antimony. *Thomson chem.* 4. p. 91.

3. Of a radiated texture, with a grey metallic streak and dark-grey powder.

*Stibium fibrosum.* *Syst. nat.* xii. 3. p. 123. n. 3.

*Wall. syst. miner.* 2. p. 196. n. 2.

Radiated sulphuret of antimony. *Thomson* 4. p. 91.

- a. With the rays parallel.

*Wall. syst. miner.* 2. p. 197. n. 2. a.

- b. With the rays scattered.

*Syst. nat.* 1. p. 172. n. 4.

*Wall. syst. miner.* 2. p. 197. n. 2. b.

- c. With the rays bundled together.

- d. With the rays disposed in a stellate manner.

*Syst. nat.* xii. 3. p. 123. n. 3. c.

*Wall. syst. miner.* 2. p. 197. n. 2. c.

4. Of a fibrous or feathery texture, in very small capillary lanuginous crystals, or siltular, or of a common form.

Stibium crystallisatum. *Syst. nat.* xii. 3. p. 123. n. 2.

Antimon. crystallisat. *Wall. syst.* 2. p. 198. n. 5.

Found in almost every country of *Europe*, massive, disseminated, or superficial, generally in matrices of quartz, lime, alumina, fluor, or barytes: it often stains the fingers, and before the blowpipe melts with a blue flame, leaving a grey oxyde of antimony: specific gravity from 4,132. to 4,516.

*argentiferum* Of a steel-blue colour, with metallic lustre, and with a whitish streak.

*Klaproth chem. annal.* 1790. 1. p. 294.

1. Of a common form.

Argentum album. *Born. ind. foss.* 1. p. 78.

2. In the form of many-sided crystals.

Argent. alb. crystal. *Born. ind. foss.* 1. p. 78.

Found near *Cremnitz* in *Hungary*, and contains antimony 34, copper 31, silver 15, sulphur 11, iron 3.

*phosphoratum.* In acicular scattered lamellar longitudinally streaked crystals, not inflaming and yielding very little smoke before the blowpipe.

*Razoumofski chem. annal.* 1786. 1. p. 291.

Phosphorated antimony. *Kirwan miner.* 2. p. 252.

Found in *Savoy*, in the cavities of a vein of sulphuret of antimony: colour white, yellow, or blackish: soft, flexible, and easily cut: before the blowpipe it does not inflame or smoke much, but fuses and leaves a grey shining brittle slag including silvery-white grains: with borax it gives a lead-coloured button, or a reddish-yellow pellucid glass: it is said sometimes to consist of small rectangular 4-sided tables; and appears to be sulphuret of antimony combined with phosphoric acid.

*muraticum.* White, shining like mother of pearl, radiate in a parallel manner, in the form of small erect 4-sided tables.

*Klaproth chem. annal.* 1787. 1. p. 334.

*Schreiber Bergm. Journ.* 1788. 1. p. 11. 1789. 1. p. 398.

*Freber nov. Act. Petrop.* 3. p. 271.

Muriated antimony. *Kirwan mineral.* 2. p. 251.

White antimor: ial ore. *Schmeiss. min.* 2. p. 229.

White ore of antimony. *Thomson chem.* 4. p. 92.

Found in *Bohemia, Saxony, Dauphiny, and Hungary*; it is totally soluble in nitro-muriatic acid, decrepitates in the fire, and easily melts when powdered, evaporating in a white smoke: with borax it leaves a metallic bead: according to Klaproth it is nothing more than a white oxyde of antimony, containing, oxyde of antimony 86, oxydes of antimony and iron 3, silic 8.

92. TELLURIUM. Bluish white, soft, very brittle and easily reducible to powder, of a lamellar texture, specific gravity 6,115: melting in a heat somewhat above the fusing point of lead, and if the heat be a little increased boiling and evaporating, attaching itself in brilliant drops to the upper part of the retort; before the blowpipe burning with a lively blue flame, the edges of which are green, and at last evaporating in a white smoke smelling like radishes: partly soluble in concentrated sulphuric acid and giving the solution a crimson red colour, which precipitates a white powder on the addition of a large quantity of water.

*nativum.* Soft, heavy, somewhat ductile, with metallic lustre.

Sylvanite. *Kirwan miner.* 2. p 324

Native tellurium. *Thomson chem.* 4. p. 97.

Found in the mine of *Mariabach* in the *Facebay* mountains of *Transylvania*, massive and disseminated: contains tellurium 92,55, iron 7,20. gold 0,25. *Klaproth.*

*graphicum.* Tin-white or inclining to yellow, soft, brittle, staining a little, in small prismatic crystals often grouped in such a manner as to resemble written characters.

Graphic Tellurium. *Thomson chem.* 4. p 98.

Found in the *Franciscus* mine at *Offenthal* in *Transylvania*, with metallic lustre: specific gravity 5,723. contains tellurium 60, gold 30, silver 10. *Klaproth.*

*album.* Silver-white passing into brass yellow, soft, heavy, somewhat ductile, with metallic lustre.

White tellurium. *Thomson chem.* 4. p. 98.

Found in the *Nagyag* mine of *Transylvania*, disseminated or crystallized in small 4-sided prisms: fracture in one direction foliated, in the other uneven: contains tellurium 44,75: gold 26,75: lead 19,50: silver 8,50: sulphur 0,50. *Klaproth*.

*bracteatum*. Between lead-grey and iron-black, in flexible plates or 6-sided tables, with very little metallic lustre.

*Aurum bracteatum*. *Gmel syst. nat.* 3. p. 383. n. 11.

Foliated Tellurium. *Thomson chem.* 4. p. 99.

Found at *Nagyag* in *Transylvania*, and is wrought for the gold which it contains: it is soluble in acids with effervescence: specific gravity 8,918. contains lead 54,0: tellurium 32,2. gold 9,0. silver 0,5. copper 1,3. silver 3,0. *Klaproth*.

**93. ARSENICUM.** Bluish-white soon becoming black and falling to powder in the air, soft, extremely brittle, specific gravity 8,310: subliming without melting in a moderate heat in a white powder emitting a strong smell resembling garlic: its sublimed oxyde giving an acrid taste to water and turning vegetable blues red, when dissolved in muriatic acid and a watery solution of sulphurated hydrogen be poured into it precipitating a fine yellow powder. *Arsenic.*

*nativum*. Uncombined, with metallic lustre.

*Arsenicum nativum*. *Cronst. miner.* 237.

Native arsenic. *Berkebeant syn.* p. 268.

Native arsenic. *Kirwan miner.* 1. p. 255.

Native arsenic. *Schweigger min.* 2. p. 262.

Native arsenic. *Thomson chem.* 4. p. 100.

1. Separating into spherical incrustations.

*Arsenicum nudum*. *Syst. nat.* xii. 3. p. 117. n. 1.

*Arsenicum nativum*. *Wall. syst.* 2. p. 162. n. 3.

2. With micaceous particles.

*Syst. nat.* xii. 3. p. 161. n. 2.

3. Friable and porous.

*Syst. nat.* xii. 3. p. 117. n. 3.

*Wall. syst. miner.* 2. p. 161. n. 1.

Found in *Great-Britain*, various parts of *Germany*, *Norway*, *Saxony*, &c. accompanying spar, barytes or feldspar, massive, rarely disseminated, often composed of hemispherical layers, corroded, branched, perforated, botryoidal, or stalactitical: colour lead-grey, but its surface soon tarnishing and becoming black by exposure to the air: streak bluish-grey, powder dull and blackish: sometimes a little sonorous when struck against a hard body, and so soft as to be easily cut with a knife: before the blowpipe it immediately emits a white smoke, diffusing its peculiar and highly poisonous vapours to a great distance, burning with a blue flame and gradually vanishing, depositing a white oxyde in the form of a powder: specific gravity 5,670. to 5,729: it is always alloyed with some iron, and often contains some cobalt, bismuth, silver, and sometimes a little gold.

*calcareum*. White, soluble in 80 times its weight of water.

Arsenic. nativ album. *Wall. syst.* 2. p. 160. n. 1.

Native calx of arsenic. *Kirwan miner.* 2. p. 258.

White oxyde of arsenic. *Schmeisser miner.* 2. p. 263.

Native oxyde of arsenic. *Thomson chem.* 4. p. 103.

White arsenic. *Berkenb. syn.* p. 268.

1. In a loose dull or mealy powder.

*Wall. syst. miner.* 2. p. 160. n. 1. a.

Loose native calx of arsenic. *Kirwan min.* 2. p. 258.

2. In a state of crystallization.

Arsenicum crystall. *Syst. nat.* xii. 3. p. 117. n. 1.

*Wall. syst. miner.* 2. p. 160. n. 1. b.

3. In an indurated state combined with earth.

Arsenic. terra mineral. *Wall. syst.* 2. p. 169. n. 10.

Indurated native calx. *Kirwan miner.* 2. p. 259.

Found in various parts of *Great-Britain*, *Germany*, *Hungary*, *Saxony*, *Bohemia*, &c. either in powder or massive or crystallized in prismatic needles: colour white or grey, with often a tinge of red, yellow, green or black: before the blowpipe it sublimes but does not inflame, and tinges borax green: specific gravity 3,700.

*Auripigmentum*.

Ponderous, yellow, curved or undulately foliated, of a waxy internal lustre, evaporating almost entirely before the blowpipe.

Pyrites nudus. *Syst. nat.* xii. 3. p. 113. n. 2.

Arsenicum flavum. *Wall. syst.* 2. p. 163. n. 5.

Orpiment. *Berkenb. synopsis.* p. 268.

Orpiment. *Kirwan mineral.* 2. p. 260.

Yellow sulphurised arsenic. *Schmeisser* 2. p. 265.

O. p. vent. *Thomson chem* 4 p. 102.

Found in *Great Britain, Hungary, Georgia, Turkey, &c.* massive disseminated, or in small imperfect crystals: colour various shades of yellow, with a considerable waxy lustre and some transparency: streak orange yellow, not metallic: texture foliated, with the plates mostly curved or undulate, rarely striate, a little flexible but not elastic: effervesces with hot nitric acid, burns with a bluish flame and before the blowpipe evaporates leaving behind a small portion of earth: specific gravity 3,048. to 3,521.

*Sandurata.* Somewhat ponderous, red with an orange-yellow streak, in striat foliations, melting easily before the blowpipe burning with a blue flame and white arsenical vapours.

*Arsenicum rubrum.* *Syst. nat.* xii. 3 p. 117. n. 4.

*Arsenicum rubrum.* *Wall. syst.* 2. p. 163. n. 4.

Realgar, *Kirawan min.* 2. p. 261.

Ruby arsenic. *Schmeisser miner.* 2. p. 267.

Realgar. *Thomson chem.* 4. p. 102.

Found in *Sicily, Naples, Hungary, Bohemia, China, Japan, &c.* massive, disseminated, superficial, or crystallized in small acutangled quadrangular or acicular prisms: colour aurora-red, ruby, scarlet, crimson, or blood-red, often variegated with yellow traces: texture lamellar, with the foliations a little flexible and so soft as to be cut with a knife, and frequently exhibiting a brilliant lustre: streak yellowish-red, powder scarlet: in nitric acid it loses its colour: specific gravity 3,338.

*sulphuratum* Hard, bluish-grey with metallic lustre, before the blowpipe emitting white arsenical vapours and blue sulphurous flames.

Arsenic. cinereo-cærules. *Syst. nat.* xii. 3. p. 118. n. 5.

Arsenic. cinereo-cærules. *Wall. syst.* 2. p. 167 n. 8.

White mundic. White pyrites, Marcasite *Berk. syn.*

Pyritical arsenical ore *Schmeisser miner.* 2. p. 268.

Arsenical pyrites. *Thomson chem.* 4 p. 101.

Found in various parts of *Great-Britain, Germany, Sweden, Bohemia, Saxony, &c.* in irregular masses, disseminated, investing, or crystallized in cubes or 4 sided prisms: colour greyish white, often a little variegated: texture uneven, sometimes granular, sometimes lamellar or radiate: when rubbed it gives the odour of garlic: specific gravity 6,522. contains arsenic 53,0. iron 19,7, sulphur 15,3. silica 12,0. *Vauquelin.*

*albicans.* Of a steel-white colour and lustre, hard, emitting white arsenical vapours before the blowpipe but no sulphur flame or vapour.

*Syst. nat.* xii. 3. p. 118. n. 6, 7.

*Wal. syst. mineral* 2. p. 165. n. 6, 7, 8.

*Misspickel. Juhl. mineral.* 181.

Arsenical pyrites, Marcasite *Kirwan miner.* 2. p. 256.

Found in *Cornwall*, near *Dublin* in *Ireland*, *Bohemia*, *Silesia*, *Saxony*, *Germany*, &c. generally dispersed among tin ores in granulations, or crystallized in 4-sided double pyramids or 4-sided obliquangled prisms: colour sometimes silvery, grey or yellowish or iridescently variegated when tarnished: texture compact, sometimes a little spintery, with the surface marked with decussate grooves or black ramifications: effervesces with nitric acid without heat, and gives an arsenical smell when rubbed: it consists of a fine alloyed with a considerable quantity of iron, but little or no sulphur: specific gravity from 5,753. to 6,522.

*argentiferum.* Of a silvery lustre and very fine granular texture, emitting arsenical vapours before the blowpipe, and when fused with lead leaving a silver bead.

*Argentum arsenicale. Syst. nat.* xii. 3. p. 150. n. 7.

*Argentum arsenico min. Wall. syst.* 2. p. 340. n. 10.

Argentiferous arsenical pyrites. *Kirwan miner.* 2. p. 257.

Found in the mines of *Saxony*, *Bohemia*, *Germany*, and *Spain*, massive, disseminated or acicular: colour nearly that of the last, but brighter and more permanent: it burns with a white flame, and leaves a reddish residuum: by solution in nitro-muriatic acid the silver will be precipitated: it consists of arsenic, sulphur, iron, and from 1 to 10 or 12 per cent. of silver: specific gravity 4,087.

94. COBALTUM. Bluish-grey with often a shade of red, hardish, very brittle, attracted by the magnet and itself convertible into the magnet, specific gravity 8,150: in a red heat gradually becoming a blue powder which becomes deeper and at last a deep black-blue, in a violent heat burning with a red flame, when fused with borax producing a fine blue glass: giving a reddish colour to its solution in nitric acid, and precipitating a blue powder with the addition of potash.

*nigrum.*

Inconspicuous, of a dusky colour, emitting no arsenical vapours when thrown on hot coals.

Cobaltum calciforme. *Cronst. miner.* 245.

Black cobalt. *Berkenb. syn.* 269.

Black oxyde or calx of cobalt. *Schmeisser min.* 2. p. 240.

Black cobalt ore. *Thomson chem.* 4. p. 107.

1. Friable, of a loose earthy consistence.

Ochra cobalti nigra. *Wall. syst.* 2. p. 183. n. 7. 2.

Loose black cobalt ore. *Kirwan mineral.* 2. p. 275.

2. Indurated.

Cobaltum scoriaceum. *Syst. nat.* xii. 3. p. 129 n. 4.

Cobaltum mineralis *Wall. syst.* 2. p. 180. n. 5.

Indurated black cobalt ore. *Kirwan miner.* 2. p. 275.

Found in the mines of Great-Britain, Austria, Saxony, Hungary, Germany, &c. either in the state of a loose friable powder, or in veins, or in corroded botryoidal or kidney-form masses: colour various shades of brown or blackish with often a shade of grey or green: when rubbed with the nail it becomes shining: it is soluble in muriatic acid: specific gravity from 3 to 4,000.

*ochraceum.* Inconspicuous, earthy internally, of a paler colour, emitting arsenical vapours when thrown on hot coals.

Ochra fulva. *Syst. nat.* xii. 3. p. 193. n. 8.

Cobalt. facie terrea. *Wall. syst.* 2. p. 181. n. 7.

Brown cobalt ochre. *Kirwan miner.* 2. p. 276.

Brown earthy oxyde of cobalt. *Schmeisser min.* 2. p. 241.

Brown cobalt ore. *Thomson chem.* 4. p. 107.



2. Dull yellow, with a brighter unctuous streak.

Yellow cobalt ochre. *Kirwan min.* 2. p. 277.

Yellow oxyde of cobalt. *Schweisser miner.* 2. p. 242.

Yellow cobalt ore. *Thomson chem.* 4. p. 107.

3. Green, in the form of minute capillary crystals, combined with nickel.

Green cobalt ore. *Kirwan mineral.* 2. p. 280.

Green oxyde of cobalt. *Schweisser min.* 2. p. 242.

Found in the mines of *Great Britain* and various parts of the continent, generally deposited on other ores, though sometimes found botryoidal or kidney-shaped: colour various shades of brown, reddish, yellowish, green or inclining to blue: it very readily forms a glass of various shades of blue.

*Cobaltigo.* Radiated, red, with a glassy lustre, emitting arsenical vapours when thrown on hot coals.

Ochra purpurea. *Syst. nat.* xii. 3. p. 195. n. 15.

Cobaltum arsenico. *Wall. syst.* 2. p. 181. n. 6.

Red cobalt ore. *Kirwan mineral.* 2. p. 278.

Red oxyde of cobalt. *Schweisser miner.* 2. p. 243.

Arseniat of cobalt. *Thomson chem.* 4. p. 108.

Found near the lakes of *Killarney* in *Ireland*, and in most places where the other ores of cobalt abound, sometimes massive, sometimes in the state of flowers: colour various shades of red from pale peach-blossom red to deep crimson: sometimes it is found deposited on different stones in the form of small 4-sided prismatic crystals disposed in a stellate or radiate manner, which are shining, semitransparent and soft to the touch: it consists of cobalt combined with the arsenical acid.

*Argentum.* Inconspicuous, of a dirty mixed colour, when burnt and fused with lead leaving a bead of silver.

Argentum nativum. *Wall. syst.* 2. p. 345. n. 16.

*Schreber Bergm. Journ.* 1788. 1. p. 43.

Found in the mines of *Norway*, *Saxony*, *Germany*, *Hungary* and *Dauphiny*, and contains a mixture of silver, iron, sometimes nickel, arsenic, rarely quicksilver, in such indeterminate proportions as to make it difficult to fix its genus.

*Sulphuratum.* Of a tin-white colour and lustre, emitting sulphurous vapours when thrown on hot coals, and at length leaving a pure oxyde of cobalt.

*Geyer chem. annual* 1788. 1. p. 67.

Sulphurised cobalt. *Schweisser miner.* 2. p. 239.

Found in *Sweden* and *Hungary*, sometimes massive, sometimes in cubical crystals without striae, and is composed of cobalt and sulphur with arsenic or iron.

*pyriticosum.* Of a steel-white colour and lustre, emitting sulphurous vapours before the blowpipe, and when heated with powdered charcoal leaving a magnetic bead.

Cobaltum ferro min. *Syst. nat.* xii. 3. p. 129. n. 2.

Cobaltum ferro min. *Wall. syst.* 2. p. 178. n. 3.

White cobalt ore. *Kirwan miner.* 2. p. 273.

White cobalt ore. *Schmeisser miner.* 2. p. 237.

White cobalt ore. *Thomson chem.* 4. p. 105.

Found in the mines of *Sweden, Hungary, Saxony, Bohemia, &c.* massive, disseminated, coating, specular, nodular, corroded, or crystallized in small 4-sided prisms or cubes or double quadrangular pyramids: colour tin white, often tarnished: texture generally fine grained, rarely striated or divergently fibrous: specific gravity from 6,284. to 6,450: contains cobalt combined with sulphur and iron.

*crystallinum.*

Of a bluish-tin colour and lustre, emitting sulphurous and arsenical vapours before the blowpipe and leaving a magnetic bead.

Cobalt. crystallif. *Syst. nat.* xii. 3. p. 129. n. 1.

Cobaltum ferro, &c. *Wall. syst.* 2. p. 176. n. 1.

Crystalline cobalt ore. *Berkenb. syn.* p. 269.

Grey cobalt ore. *Schmeisser min.* 2. p. 235.

Dull grey cobalt ore. *Kirwan min.* 2. p. 270.

Grey cobalt ore. *Thomson chem.* 4. p. 106.

Found in the mines of *Cornwall* and various parts of *Europe*, of a dull grey colour with the surface often tarnished: the crystals are usually 6-sided prisms terminated at each end by an irregular 6-sided pyramid, so that the crystal consists of 6 tetragons and 12 hexagons, with the faces striate in an opposite manner: it consists of cobalt combined with arsenic, sulphur and iron in various modifications.

*arsenicale.* Of a dull steel-grey colour and lustre, emitting arsenical vapours before the blowpipe and leaving a magnetic bead.

Cobaltum ferro, &c. *Syst. nat.* xii. 3. p. 129.

Cobaltum ferro, &c. *Wall. syst.* 2. p. 177. n. 2.

Found in the mines of *Europe*, accompanying the other cobalt ores, of a granular texture approaching to the flat or conchoidal, rarely fibrous in a parallel stellate or fascicled manner, of a common or botryoidal form, sometimes marked with black shrublike lines: it resembles the last species except that it contains little or no sulphur.

*hispanicum*. Of a steel-white colour and lustre, emitting sulphurous and arsenical vapours and leaving a bead not attracted by the magnet.

Found in the mines of *Arragon* in *Spain*, and consists of cobalt, sulphur and arsenic without a visible mixture of iron:

**95. MAGNESIUM.** Dark grey gradually blackening by exposure to the air, hard, very brittle, of a granular texture, attracted by the magnet when reduced to powder, specific gravity 7,000: melting with great difficulty; its black oxyde assuming a green colour which in a very violent heat is fused and converted into a green glass, when fused with borax producing a deep red glass: when dissolved in sulphuric acid leaving a black spongy mass behind, and forming a red precipitate with the addition of soda.

*Manganese.*

*regulina*. Staining the fingers, of a silver-grey colour with metallic lustre, and divergingly foliated texture.

*Lapeyrouse Ann. acad. Tolos.* 1. p. 256

Native metallic manganese. *Schweitzer* 2. p. 251.

Found in the valley of *Vied-fos* near *Lem* in the neighbourhood of *Foix* on the *Pyrenees*, in kidney form masses: it is slightly malleable, and not attracted by the magnet.

*ochracea*. Friable, without lustre or transparency, earthy.

*Ochra magnesiæ. Syst. nat.* XII. 3. p. 194. n. 9.

*Magnesia friabilis Cronst. m. eval* 114

Incurated earthy ochre. *Kirawan miner* 2. p. 294.

Found in *England*, the *Pyrenees*, the mines of *Franconia*, and in the *Altai* mountains of *Siberia*, massive or disseminated, cellular, porous, perforated, or in various imitative forms: texture earthy, rarely imperfectly foliated: colour blackish, or brown like the brown hæmatites: specific gravity before it has absorbed water 3,707. after absorption 3,903.

*piñorum*. Black, friable, floating, mixed dry with a fourth of its weight of linseed oil producing spontaneous inflammation.

*Wad. Kirawan miner* 2. p. 293.

*Bergman chem. annal.* 1784. 2. p. 367.

Found in *Derbyshire*, forming considerable strata, friable and generally smooth between the fingers, and of a blackish or reddish-brown colour: contains manganese, oxyde of iron, lead, and mica.

*nigra.* White, becoming brownish or blackish when heated, soft, effervescing with nitric acid and emitting sulphurated hydrogen gas.

White calx of manganese. *Kirwan miner.* 2. p. 297.

White ore of manganese. *Berkenb. syn.* p. 270.

Carbonat of manganese. *Thomson chem.* 4. p. 113.

Found in the mines of *Great Britain*, *Norway*, *Sweden*, and *Transylvania*, in round or kidney-form masses, or variously disseminated, sometimes in loose scales: colour white with often a reddish tinge: texture either radiated or in incurved foliations: with the muriatic acid it gives the smell of nitro-muriatic acid: before the blowpipe it gives a violet colour to borax.

*rubra.* Red, colouring glasses red.

*Cronst. mineral.* 115. B. 1. b.

Found near *Piedmont* and *Lem* on the *Pyrenees*, in round lumps or fibrous in a stellate manner.

*vulgaris.* Soft, staining the fingers, of a steel-grey colour with metallic lustre.

*Ferrum fuscum.* *Syst. nat.* 1. p. 176. n. 8.

*Molybdænum.* *Syst. nat.* xii. 3. p. 121. n. 2.

*Magnesia fuliginosa.* *Wall. syst.* 2. p. 138. n. 2.

Black and brown ore. *Berkenb. syn.* p. 270.

Grey ore of manganese. *Kirwan miner.* 2. p. 291.

Grey oxyde of manganese. *Schmeissner miner.* 2. p. 252.

Grey oxyde of manganese. *Thomson chem.* 4. p. 109.

Oxide of manganese. *Sowerby Brit. min. tab.* 86.

Found in various parts of *Great Britain*, particularly on *Mendip hill* in *Somersetshire*, in *Sweden*, *France*, *Germany*, *Bohemia*, *Silesia*, &c. massive or disseminated, or variously imitative, in small acutangled quadrangular prisms or 6-sided acicular columns with the faces often longitudinally striate: colour greyish-white more or less dusky, with sometimes a small tinge of red: texture seldom compact, generally fibrous in a stellate manner, radiated, or foliated, with the fragments indeterminate or wedge-form or splintery: soft, brittle, with a black or brown streak: before the blowpipe it becomes blackish-brown but does not melt, and tinges borax violet: it is used for colouring glass, as an ingredient in printer's ink, and for procuring oxygenic gas from; nearly two quarts of this gas

may be obtained from an ounce of the oxyde: it contains from 30 to 45 per cent. of oxyde of manganese, from 30 to 40 of oxygene, and small quantity of oxyde of iron, carbonate of lime, barytes and silica.

- nigra.* Soft, staining the fingers, black with hardly any lustre.  
*Magnesia scoriacea* *Cronst min* 116 2. a.  
*Magnesia scoriacea.* *Wall. syst.* 1. p. 329 n. 2. b.  
 Black or brown manganese. *Kirwan miner.* 2. p. 292.  
 Black calciform manganese. *Schmeisser min.* 2. p. 253.  
 Black ore of manganese. *Thomson chem.* 4. p. 112.  
 Found commonly in the mines containing the grey ore, massive, investing, or variously imitative: colour black or dark brown, sometimes with a bluish cast, and often variously coloured on the surface: texture earthy, compact, even or slightly conchoidal: in its composition it resembles the last, but contains more iron: its crystals are usually 8-sided prisms with their faces smooth.

- Petracorius.* Hardish, staining the fingers, blackish, shining internally, becoming red when heated.  
*Magnesia compacta.* *Wall. syst.* 1. p. 330 n. 3.  
 Perigord stone. *Kirwan mineral.* 2. p. 295.  
 Found at *Perigord* in *France*, lustrous, of a compact texture, and brownish-black colour: when heated it hardens and becomes reddish-brown, but not magnetic, and gives a red or violet tinge to borax: besides manganese it contains alumina and iron.

- rossa.* Pale rosy red, foliated, not staining the fingers, easily melting with effervescence.  
 Red ore of manganese *Kirwan mineral.* 2. p. 297.  
 Reddish-white oxydated manganese. *Schmeisser* 2. p. 254.  
 Red ore of manganese. *Thomson chem.* 4. p. 112.  
 Found in the *Nagyag* mines of *Transylvania*, where it is the matrix of gold, and near *Kapnik* in *Hungary*, massive, loose, disseminated, or imitative, sometimes crystallized in rhomboidal prisms or needles: texture foliated in thin incurved layers, with the fragments often splintery: colour pale rosy red mixed with white, powder whitish: it effervesces with nitric and muriatic acids, becomes reddish-brown when heated to redness, and tinges borax red: specific gravity 3,233: contains, silica 55, oxyde of manganese 35, oxyde of iron 7, and about 2 of alumina. *Ruprecht,*

**96. TUNGSTENUM.** Greyish or brownish, internally steel-white, very brittle and hard, not attracted by the magnet, specific gravity 17,600: fusing with great difficulty, gradually changing from a black to a yellow oxyde when heated, which with the addition of microcosmic salt is at last converted into a blue glass: soluble in the nitric acid into a yellow oxyde. *Tungsten. Wolfram.*

*calcareum.* Ponderous, lamellar, extremely brittle, yellowish-white or grey, digested with hot nitric acid becoming yellow.

Jernsten. *Cronst. mineral.* 208.

Ferrum lapide vitesc. *Wall. syst.* 2. p. 253. n. 7.

Tungsten. *Scheele nov. Act. Stockb.* 1781. p. 89.

Scheelium. *Karsten Leske miner.* 1. p. 575.

Tungsten. *Kirwan mineral.* 2. p. 315.

Tungstat of lin.c. *Thomson chem.* 4. p. 115.

Found near *Pengwilly* in *Cornwall*, in *Saxony*, and *Bohemia*, in tin mines, and is often mistaken for tin-stone, sometimes in flve or disseminated, sometimes crystallized in double 4-sided pyramids: it decrepitates but does not melt in a white heat: with borax it forms a colourless glass, but if the borax exceed a brownish one: specific gravity from 5,800. to 6,028: contains, oxyde of tungsten 70, lime 30. *Scheele.*

*magnesia-*  
*tum.* Very ponderous, lamellar, opaque, of a blackish-brown colour and reddish brown streak, forming a greenish glass with borax.

Molybdænum *Syst. nat.* xii. 3. p. 123. n. 3.

Magnesia crystallina. *Wall. syst.* 1. p. 330.

Scheelium ochraceum. *Karsten Leske mineral.* 1. p. 576.

Wolfram. *Kirwan miner.* 2. p. 316.

Manganeseous wolfram. *Schmeiss. min.* 2. p. 272.

Wolfram. *Thomson chem.* 4. p. 114.

Found in *Cornwall*, *Spain*, *Britany*, *Saxony*, and *Bohemia*, in tin mines, massive or crystallized in right angled 4 sided tables, or 6 sided compressed prisms ending in 4-sided summits: texture foliated, and easily separated into plates by percussion: it is infusible by the blowpipe, and forms a deep red glass with microcosmic salt: specific gravity from 7,006. to 7,322 contains oxyde of tungsten 65, oxyde of manganese 22, oxyde of iron 13. *Althaus.*

97. **MOLYBDÆNUM.** Bluish-grey not tarnishing, brittle, not magnetic, composed of scaly particles cohering together, specific gravity 7,500: nearly infusible, gradually becoming a white volatile oxyde when heated, which with borax forms a violet and with microcosmic salt a green glass: partly soluble in sulphuric acid, and giving the solution first a green and then a blue colour.

*vulgare.*

# **MOLYBDÆNUM.**

Molybdænum. *Syst. nat.* xii. 3. p. 121. n. 1.

Molybdæna pura. *Wall. jyst.* 2. p. 249. n. 1. a.

Molybdenite. *Kirwan mineral* 2. p. 319.

Sulphurised molybdæna. *Schmeisser miner.* 2. p. 256.

Sulphuret of molybdæna. *Thomson chem.* 4. p. 117.

Found in *France, Spain, Sweden, Saxony, Siberia, and Ireland*, in gangues of felspar, lithomarg, or quartz, generally in masses consisting of small grains agglutinated together, sometimes crystallized in 6-sided tables: colour light lead-grey, with some times a shade of red; streak bluish grey, metallic; powder bluish: soft, opaque, staining the fingers, and feeling a little greasy to the touch: texture lamellar, with the foliations thin, incurved, and slightly flexible: with warm nitric acid it effervesces, leaving a grey oxyde undissolved: before the blowpipe it evaporates in white sulphurous vapours: specific gravity from 4,569. to 4,738: contains, molybdænum 60, sulphur 40. *Klaproth.*

**98. URANIUM.** Dark-grey inclining internally to brown, with a slight lustre, soft, brittle: specific gravity 6,440: hardly fusible before the blowpipe, but with borax forming a brown and with microcosmic salt a grass-green glass: convertible into a yellow oxyde by the nitric acid.

*ochraceum.* Yellowish or green, of an earthy texture, entirely soluble in nitric acid, combined with a large portion of oxygene.

Uranites. *Klaproth chem. annal.* 1789. 2. p. 403.

Uranitic ochre. *Kirwan mineral.* 2. p. 303.

Earthy oxyde of uranit. *Schmeisser miner.* 2. p. 276.

Yellow oxyde of uranium. *Thomson chem.* 4. p. 119.

Generally found on the surface of Uranium sulphureum or Pechblende in Cornwall, &c. of a lemon or brimstone yellow or green: it slightly stains the fingers, is meagre to the touch, hardly fusible before the blowpipe, but in a strong heat becomes black: specific gravity 3,243: consists of oxyde of uranium and oxygene.

*Chalcolithus.* Hardish, diaphanous, shining internally, of a foliated texture, entirely soluble in nitric acid.

Uranites spathosus. *Klapr. chem. annal.* 1789. 2. p. 403.

Chalcolit. *Werner Bergm. Journ.* 1789. 1. p. 376.

Micaceous uranitic ore. *Kirwan miner.* 2. p. 304.

Spatous uranit. *Schmeisser miner.* 2. p. 276.

Crystallized oxyde of Uranium. *Thomson* 4. p. 119.

Oxide of Uranite, *Sorwerby Brit. min.* t. 125.

Found in Cornwall, near Eibenstock and Johanngeorgenstadt in Saxony, and near Rheinbreidenbach in the electorate of Trier, sometimes on the surface of other ores, sometimes in larger or less particles mixed with rocks of gneiss, garnet or quartz, most commonly crystallized in cubes, square plates, 8-sided or 6-sided prisms: colour emerald or grass green, often inclining to silvery-white or yellowish, with a greenish-white streak: lustre sometimes perlaceous, sometimes metallic: texture foliated, brittle: soluble in nitric acid without effervescence, but insoluble and infusible by alkalies: consists of oxyde of uranium, carbonic acid, and the green kind a little oxyde of copper.



*sulphureum*. Hardish, very ponderous, black, compact, shining internally.

Uranites sulphuratus. *Klaproth chem. annal.* 1789. 2. p. 403.

Pechblende. *Werner Bergman Journ.* 1789. 1. p. 384.

Sulphurated uranite. *Kirwan miner.* 2. p. 305.

Sulphurated uranit. *Schmeisser min.* 2. p. 275.

Pechblende. *Thomson chem.* 4. p. 118.

Found at *Johanngeorgensladt* in *Saxony*, either forming entire thin strata alternating with other stratified minerals, or massive and dispersed: colour black, dark grey, or bluish black, with a darker streak and opaque black powder: texture conchoidal, very brittle: imperfectly soluble in sulphuric and muriatic acids, but perfectly in nitric and nitro-muriatic acids, giving the solution a vinous yellow: forming a grey opaque slag with borax and soda, and a green glass with microcosmic salt: specific gravity 6,378 to 7,500: contains, uranium 86,5: sulphuretted of lead 60: silica 5,0: oxyde of iron 2,5: *Klaproth*.

99. TITANIUM. Orange-red, very hard, in minute agglutinated grains, specific gravity —: not fusible by any known heat, but when exposed hot to the open air forming a blue or purple oxyde: precipitating a white powder when its crystals or red oxyde are fused in 4 times their weight of potash, and the whole dissolved in water.

*Menacka-  
sita.*

In small irregularly shaped grains, black, easily pulverised and the powder attracted by the magnet.

Menackanite. *Kirwan miner.* 2. p. 326.

Menackanite. *Crell's annals*, iii. p. 252.

Menackanite. *Thomson chem.* 4. p. 122.

Found in the valley of *Menackan* in *Cornwall*, in small grains resembling gunpowder of no determinate shape, and often mixed with fine grey sand: it does not detonate with nitre, but melts with two parts of fixed alkali into an olive-coloured mass, from which nitric acid precipitates a white powder, and this powder mixed with diluted sulphuric acid so that the mass be not too liquid, and evaporated to dryness, produces a blue mass: before the blowpipe it does not decrepitate, but with microcosmic salt it acquires a greenish tinge

which becomes brown on cooling: specific gravity 4,427: contains, oxide of iron 46, oxide of titanium 45, with some silica and manganese. *Gregor*.

**Iserina.** In small rounded grains, brownish-black, hard, brittle, of a conchoidal texture, not attracted by the magnet.

Iserine. *Journ de mineral*. 13. p 67.

Is mine. *Thomson chem*. 4. p 124.

Found in the sand of the river *Iser* in *Bohemia*, of an iron-black colour tending to brown, and is hard, heavy, and brittle.

**Rubila.** Compact, reddish brown, opaque, of a foliated texture, forming a violet-black glass with microcosmic salt.

Titanite. *Kirwan m n* 2. p. 329.

Ruthile. *Thomson chem*. 4. p 120.

Found in *Hungary*, the *Pyrenees*, the *Alps*, and in *Britany*, generally crystallized in 4 or 6-sided prisms or acicular: colour red or brownish-red, with a brick or orange powder: when fused with carbonate of potash and diluted with water, a white powder precipitates: before the blowpipe it does not melt, but becomes opaque and brown: with borax it forms a deep yellow glass with a tinge of brown: it mixes with soda, but does not form a transparent glass: specific gravity from 4,180. to 4,246: when pure it is composed entirely of oxide of titanium. A variety called *Anatase* is found in *Dauphiny*, varying in having its crystals in an elongated octahedron whose base is a square, with the summits complete or truncated, and the faces transversely striate: colour steel-grey verging to black or deep blue: lustre vitreous, generally opaque: specific gravity 3,857.

**Nigrina.** Compact, hard, brittle, with a waxy lustre and foliated texture, imperfectly soluble in muriatic acid, from which it precipitates a clammy yellowish mass with the addition of ammonia.

Calcareo-siliceous titanic ore. *Kirwan miner* 2. p. 331.

Nigrine, Titanite, Sphene. *Thomson chem*. 4. p 123.

Found near *Passau* in *Bavaria*, at *Arendal* in *Norway*, and near *St. Gothard*, sometimes massive or disseminated, sometimes crystallized in short obtusangled 4 sided prisms: colour reddish, yellowish or blackish brown, rarely whitish-grey with a whitish-grey powder: before the blowpipe it is infusible, but in charcoal it is converted into a black opaque porous slag: specific gravity 3,510: contains, oxide of titanium 33, silica 35, lime 33. *Klaproth*.

100. CHROMIUM. White with a shade of yellow, very brittle, specific gravity —: very difficult of fusion: gradually oxydating in the nitric acid, and the oxyde becoming green when heated in a close vessel.

*Plumbi.* Red with a shade of yellow and a fine orange-yellow streak and powder, texture compact, crystallized in 4-sided prisms.

Plumbum haedrum. *Syst. nat.* xii. 3. p. 134. n. 8.

Plumbum sulph et arsen. *Wall. syst.* 2. p. 309. n. 8.

Plumbum rubrum. *Gmel. syst nat* 3. p. 367. n. 8.

Red lead spar. *Kirawan miner* 2. p. 214.

Red lead ore. *Schmeffer miner.* 2. p. 169.

Chromat of lead. *Thomson chem.* 4 p. 125.

Found in the gold mines of *Berejof* near *Ekaterinbourg* in *Siberia*: the prisms are sometimes terminated by 4-sided pyramids: lustre or transparency hardly any: it is rather soft, with an uneven fracture. does not effervesce with acids, decrepitates before the blow pipe leaving a small portion of lead and a considerable remainder of black slag which gives a green colour to borax: specific gravity from 5,750. to 6,029: contains, oxyde of lead 65,12: chromic acid 34,88. *Vauquelin.*

*Ferri.* Brown with an ashy-grey powder and slight metallic lustre, melted with potash and dissolved in water imparting an orange-yellow colour to the solution.

Chromat of iron. *Thomson chem* 4. p 126.

Found near *Gassin* in *France*, and in *Siberia*, in irregular masses: colour resembling that of brown blende: hardness sufficient to scratch glass: insoluble in nitric acid, and melts with borax into a fine green glass: specific gravity 4,032: contains, chromic acid 43,0. oxyde of iron 34,7. alumina 20,3: silica 2,0. *Vauquelin.*

**101. COLUMBIUM.** Brownish-black internally iron-grey, with a chocolate-brown streak and powder, hardish, very brittle, of an imperfectly foliated texture, opaque, not attracted by the magnet: specific gravity 5,918.

*compactum.* **COLUMBIUM.**

Columbite. *Thomson chem.* 4. p. 127.

Sent to Sir Hans Sloane from *Massachusetts*, and is at present in the British Museum: colour dark grey-brown with a glassy lustre: rather hard, and very brittle: longitudinal fracture imperfectly lamellar, cross-fracture fine grained: when exposed to a violent heat for a long time was found in a state of black powder: contains, oxyde of columbium 78, oxyde of iron 21.

**102. TANTALIUM.** Blackish-grey, softish, of a granular fracture, not magnetic, specific gravity 6,500: not soluble in any acid, nor altering its colour when heated to redness; melting with phosphate of soda and borax into a colourless glass.

*manganesi-*  
*alum.* Consisting of oxyde of tantalum combined with the oxydes of iron and manganese.

Tantalite. *Thomson chem.* 4. p. 127.

Found at *Kimito* in *Finland*, in irregular crystals: colour between bluish-grey and blackish-grey: surface smooth with metallic lustre: very hard, not magnetic, fracture compact: specific gravity 7,953.

*yttriatum.* Consisting of oxyde of tantalum combined with the oxydes of iron and yttria.

Yttrotantalite. *Thomson chem.* 4. p. 128.

Found at *Kimito* in *Finland*, in small kidney-form masses of inconsiderable hardness: fracture granular, iron-grey, of metallic lustre: may be scratched with a knife, and gives a grey powder: specific gravity 5,130.

## CLASS V. PETRIFICATIONS.

*Animals and vegetables, or their parts, changed into a fossil substance.*

- 103. ANTHROPOLITHUS. Man or the parts of man.
- 104. ZOOLITHUS. Mammalia or their parts.
- 105. ORNITHOLITHUS. Birds or their parts.
- 106. AMPHIBIOLITHUS. Amphibia or their parts.
- 107. ICTHYOLITHUS. Fishes or their parts.
- 108. ENTOMOLITHUS. Insects or their parts.
- 109. HELMINTHOLITHUS. Worms or their parts.
- 110. PHYTOLITHUS. Vegetables or their parts.

## PETRIFACTIONS.

103. ANTHROPOLITHUS. The human body, or some of its parts, changed into a fossil substance.

*totalis.* The whole human skeleton.

Zoolithus Hominis. *Syst. nat.* xii. 3. p. 156, n. 1.

Zoolithus Hominis. *Gesner Petrifac.* 73.

Anthropolithus. *Carth. min.* 81.

Found at *Faklun* in *Sweden*, imbedded in a mass of sulphuret of iron or pyrites, and as it has been recorded, converted into a hard stone, in the year 1585: it has likewise been found in some mineral waters in *France*, and near *Freyburg* in *Saxony*.

*partialis.* The cranium or other bones.

*Grew mus. soc. reg.* p. 332.

*Kundmann promptuar* p. 255.

Said to have been found in the mountains not far from *Rheims* in *France*.

104. ZOOLITHUS. The body of some animal of the mammalia, or its parts, changed into a stony substance.

*Turcosa.* The teeth: hardish, of a bluish green colour.

*Zoolithus dentis.* *Syst. nat.* xii. 3 p. 156 n. 4.

*Turcosa gallica.* *Raum. Aët. Paris.* 1718. p. 230.

*Zoolithi dentium.* *Wall. jyst.* 2 p. 575. n. 5.

Bone tinged by copper *Berkenhout syn.* p. 279.

*Woodward foss.* 1. part 2 p. 87.

Found in the copper mines of *Cumberland*, in *Persia*, *Siberia*, *Bohemia*, *France*, *Germany* &c. and are held in great estimation by the inhabitants of the East: their colour is greenish with a tinge of blue, which after long exposure to the air becomes a dirty yellow brown or blackish, opaque, hard, adhering a little to the tongue, and admitting some degree of polish and lustre: their colour seems to be acquired by the oxides of iron and copper.

*Osteolithus.* The bones becoming a calcareous substance,

*Karsten Leske minera.* 2. p. 43.

Animal bones. *Berkenhout syn.* p. 279.

Animal bones *Brand foss.* fig. 118—121.

*Woodward foss.* 1. part 2. p. 87.

Found in *Great-Britain* and some parts of the continent, converted into common limestone,

*Simia.* The entire skeleton of the ape.

*Swedenbourg regn subterræn.* p. 168. t. 2.

Found in the year 1733, at *Henneburg* near *Glücksbrun*, imbedded in bituminous marl impregnated with copper.

*Elephantis.* The tusks, grinders, or bones of the elephant,

Elephants tusks. *Berkenhout syn.* p. 279.

*Woodward Meth.* 124. catal. part 2. p. 86.

Found in various bogs of *England* and *Ireland*.

*Cervi.* The skeleton, horns, or separate bones of the stag.

*Zoolithus Cervi.* *Syst. nat.* xii. 3 p. 136. n. 2.

*Zoolithus Cervi.* *Gesner petrificat.* 43.

Skeleton Alces. *Hermann marlograph*

*Zoolithus cornu cervi.* *Born ind. foss.* 2. p. 1.

Stag's horn. *Berkenhout syn.* p. 279.

*Woodward Meth.* 124. catal. 1. part 2. p. 86.

Found often buried in the ground in some mountains in *England* and *Ireland*, especially the horns of the Moose Deer; and in the mountains near *Baruth* in *Silesia*, sometimes the whole skeleton, sometimes parts only.

*Rosmar.* The head of the morfe.

*Monti monument. diluv. 1719. p. 4.*

Found in the neighbourhood of *Bononia* in *Italy*.

*Bovis.* The skeleton of the ox.

Found about a century ago between *Querfort* and *Gatterstedt* in *Saxony*.

*Soricis.* The skeleton of the shrew.

Found in *Bohemia*, buried in shistus.

105. ORNITHOLITHUS. The body, or parts of a bird, changed into a fossile substance.

*rostri.* The beak.

*Ornitholithus rostri. Syst. nat. xii. 3. p. 157. n. 2.*

*Xylostea rostrorum. Wall. syst. 2. p. 567. n. 4. a.*

Found in the neighbourhood of *Jena* and in the mountains on the confines of *Switzerland*, sometimes perfect, sometimes only impressed on a shistose swinestone.

*ossium.* The bones of birds.

*Typolithi ossium. Wall. syst. min. 2. p. 567. n. 4.*

*Hermann marlograph. 2. c. 9. p. 224.*

Found in *Silesia*.

*plumarum.* The feathers of birds.

*Ornitholithi plumarum. Wall. syst. 2. p. 566. n. 2.*

*Scheuchz. querel et vind. pisc. p. 14. tab. 2.*

Found principally at *Oeningen* on the confines of *Switzerland*, impressed on a shistose swinestone.



106. AMPHIBIOLITHUS. The body, or some part, of an amphibious animal changed into a fossil substance.

*Testudinis.* The tortoise.

*Gesner Petrifaet.* 41.

Found entire or in parts sometimes in the stone quarries of *Oxfordshire*, in a bed of shilt in *Switzerland*, on *St. Peter's mountain* near *Mæßriß* in *Brabant*, near *Berlingham* in *Switzerland*, in *Malta*, in *Leipsic* or other parts of *Saxony*.

*Rana.* The toad or frog.

*Gesner Petrifaet.* 40, 41.

*Lapis bufonem exhibens.* *Spener Miscell. Berol.* p. 102.

The head of a frog found in a bed of shilt in *Switzerland*, and an entire petrified toad in a slaty swinestone at *Oeningen*.

*Crocodyli.* The entire sceleton of the crocodile.

*Stuckeley Philosoph. Transact. n.* 360. p. 936. fig.

*Crocodyli scel.* *Misc. Berol.* 1710. p. 103. fig. 24.

*Sceleton Crocodyli.* *Act. Lips.* 1718. p. 188. t. 11.

Found near *Elston* in *Glocestershire* in indurated clay, near *Drax* in *Aquitain*, at the depth of 50 yards under the surface of the earth, near *Suhl* in *Henneburg*, and near *Boll* in *Wirtemberg* in a slaty stone.

# 107. ICHTHYOLITHUS. The body or parts of a fish changed into a fossil substance.

*niger.*

In a black slaty stone.

*Ichthyolithus totalis.* *Syst. nat.* xii. 3. p. 159. n. 1.

*Wolf Half tab.* 13—20. *Davil. curios.* 5. tab. 4.

*Pisces petrificati.* *Ryl. Saxon* 1. p. 4 fig. 1—3. p. 47. f. 12.

*Pisces petrificati.* *Braun miner* 2 tab. 7, 8.

*Lapis islebianus.* *Geser* fig. 161.

*Lluid Llythop ep. st.* 1. p. 86 tab. 22. fig. 1.

Found in a black slate in the island of *Sheppey* and various parts of *Wales*, in the mountains of *Switzerland*, *Silesia*, *Germany*, &c. impregnated with bitumen, pyritaceous matter or oxyde of copper: the fishes themselves resemble the Eel, Sword fish, Cod, Flat-fish, Perch, Roach, Dace, Mackrel, Mullet, Carp, Tench, Pipe-fish, Ray, &c.

*albidus.*

In a pale slaty stone.

*Ichthyolithus totalis.* *Syst. nat.* xii. 3. p. 159. n. 2.

*Ichthyolithus totalis.* *Rumph. mus.* tab. 59 f. H.

Found in various parts of *England*, on mount *Libanus* in *Palestine*, in the ecclesiastical territories of *Italy*, in *Switzerland*, *Bavaria*, &c. the fishes are rarely of the sea-kind, as Flat-fish, Mackrel, Gurnard, &c. but usually of the fresh-water kind, as eels, perch, tench, dace, roach, salmon, &c. they are seldom found whole, but in different parts, as the head, gill-covers and other bones, fins, tails, tendrils, or scales, in a grey slaty freestone or impressed on shistose marble, and sometimes penetrated with bitumen.

*Bufonites.* The grinders of the sea-wolf.

*Toadstone.*

*Ichthyolithus dentis.* *Syst. nat.* xii. 3. p. 198. n. 4.

*Philosoph. Transact.* n. 200 p. 750.

*Lluid Lithophil.* p. 70. cap. 20.

*Woodward* 1. part 2. p. 84.

Found in various parts of *England*, particularly in *Oxfordshire*, generally roundish and hollowed like a cup, from the size of a small pea to nearly an inch in diameter: colour black, grey, or brown, sometimes finely variegated, always polished.

*Glossopetra.* The teeth of the shark.

*Amphibiol. dentis.* *Syst. nat.* xii. 3. p. 158. n. 6.

*Olear mus.* tab. 21. *Butin. diluv.* 242. tab. 24. B.

*Worm mus.* 67. f. 4. *Wolf. half.* tab. 21.

*Lluid Lithophil.* tab. 15.

1. Two-edged and ferrate.
2. Two-edged, incurved, very entire.
3. Two-edged, straight, very entire.
4. Slightly 2 edged, forked at the base.
5. Cylindrical, straight, striate, 3-cleft.
6. Subulate, striate.

Found in various parts of *England* and *Scotland*, in *Malta*, *Italy*, *France*, *Germany*, &c. of various sizes, solitary or many together, loose or attached to other fossils, fibrous internally, shining outwardly, of a glaucous, bay, dark-brown, rarely sea green colour.

## 108. ENTOMOLITHUS. The body, or some part, of an insect changed into a fossil substance.

*Cancr.* The crab or some of its parts.

*Entomolithus cancri*. *Syst. nat.* 1. p. 197 n. 1.

*Cancer lapideus*. *Scheuchz. gaer.* 29. tab. 4.

*Lluid Lithobb.* *Brit. cap.* 20.

*Cancer lapidefactus*. *Rumph. mus.* tab. 6. f. 1—3.

*P. gurus lapideus*. *Gesn. fig.* 167. *Davil. cat.* t. 3. f. G.

*Kundm. rar. nat.* tab. 4.

*Baier monim. rar. petrif.* tab. 8.

Found in various parts of *Great-Britain*, and in most parts of the globe, in slate or foliated limestone, either entire or in parts, as the shell, legs, claws, &c. and of various species.

*Monoculi.* The monocus polyphemus.

*Andrea Br. aus der Schweiz* p. 32 tab. 4.

Found near *Solenhofen*, in foliated limestone.

*paradoxus.* The oniscus paradoxus

*Entomolithus oniscus*. *Syst. nat.* xii. 3. p. 160. n. 2.

*Mus. Tess.* tab. 3. f. 1. 2. *A. Stockh.* 1759 t. 1. f. 1—4.

*It. Oel.* f. 147. *It. Worb.* 87 f. 83.

*Bromel A&B Uss.* 1729 p. 491. tab. 496 497

Found in various parts of *Great Britain* and the continent, in various kinds of limestone and indurated clay or slate, loose or affixed, solitary or in numbers, entire or in parts, straight, incurved, expanded or contracted: the head covered

with a very convex, roughish, often 3 parted shell semilunar on the fore-part, grooved its whole length, with 2 hemispherical or cylindrical tubercles above on the sides: trunk cylindrical, 3-lobed, covered with a laminar shell consisting of versatile triarcuated rings: tail thin, 3-parted by 3 tubercles.

109. HELMINTHOLITHUS. The body, or parts, of a crustaceous worm or shell-fish changed into a fossil substance.

*Asteria.* The star-fish or its parts.

1. The *Asterias papposa*.

In slaty limestone at *Pappenheim*.

2. The *Asterias rubens*.

In *St. Peter's mountain* near *Mæsstricht*.

3. The *Asterias minuta*.

*Helmintholithus Astrion*. *Syst. nat.* xii. 3. p. 166. n. 11.

*Astrion*, Sea star. *Berkenb. synopsis* p. 272.

*Astrion*. *Plot. Oxfordsh.* 85 n. 16.

Found in chalk pits in various parts of *England*, minute, reddish-white, in form of a star or wheel with 4 or 5 radii, somewhat convex in the centre.

4. The *Asterias glacialis*.

In *France* near *Muleme*.

5. The *Asterias reticulata*.

In *France* near *Chassuis* on the *Soane*.

6. The *Asterias aurantiaca*.

*Walch. Steinr.* 1. p. 107, 108. tab. 2. n. 1.

7. The *Asterias equestris*.

In sandstones in *Saxony*.

8. The *Asterias ophiura*.

In *Italy* and *Germany* in marble, and with solitary rays at *Rotenburg*, and near *Heuneburg* in a yellow shining sandstone.

9. The *Asterias pectinata*.

At *Pappenheim* in slaty limestone.

10. The *Asterias muloradiata*.

*Helminolithus alveolatus*. *Syst. nat.* xii. 3. p. 166.

Near *Staatgard*, with the rays aggregate.

11. The *Asterias Caput Medusæ*.

These are found generally in mountains of chalk, limestone or sandstone, sometimes the mere impressions.

*Echini:* The Echinus or sea hedgehog.

A. Entire.

Helmintholithus Echinites. *Syst. nat.* xii. 3. p. 166. n. 10.

*Rumph. mus.* tab. 50. f. 7. 9. t. 59. f. C. E. F.

Echinites. *Gesn. fig.* 168. b. 1. 2. 156. b. 1, 2.

Echinites. *Lud. lithop. Brit. cap.* 15.

Echinites. *Berkenhout syn.* p. 272.

1. The Echinus esculentus.

Found in *England, Saxony, Germany, &c.* in chalk, lime, marl, flint, or agate.

2. The Echinus excavatus.

*Klein echinod. ap. Leske, p.* 95. tab. 44. f. 3, 4.

In marble at *Verona*, of a yellow-grey colour.

3. The Echinus globulus?

Found in *England*, near *Mæstricht*, in *Westphalia*, *Hercynia* and near *Hesse*, generally calcareous, rarely in flint.

4. The Echinus saxatilis.

In limestone near the salt-pits in *Upper Austria*.

5. The Echinus ovarius.

In *England*, *Normandy*, and *Switzerland*, in chalk and limestone hills.

6. The Echinus Diadema.

In the mountain *Randberg* in *Switzerland*, and at *Rotenburg* in *Westphalia*.

7. The Echinus circinatus.

*Leske, ap. Klein echinod. p.* 119. tab. 45. f. 10.

8. The Echinus Cidaris.

Found in *England*, *Saxony*, *Franconia*, *Wurtemberg*, and various parts of *Europe*, in flint, chalk or marble.

9. The Echinus mamillatus.

In *Malta*, *Switzerland* on the limestone mountain *Legerburg*, and near *Bassville* in iron ore.

10. The Echinus Lucunter.

In the chalk hills of *England*.

11. The Echinus coronalis.

*Leske ap. Klein echinod. p.* 136. tab. 8. A, B.

In the flint and chalk hills of *England*.

12. The Echinus asterizans.

*Klein. echinod. ap. Leske, p.* 141. tab. 8.

Found filled with cretaceous matter, the shell itself being converted into spar.

13. The Echinus testillatus.  
*Klein echinod. ap Leske, p. 153. tab. 11. G.*  
 In the chalk hills of *Basil*.
14. The Echinus botryoides.  
*Klein. echinod. ap Leske. p. 154. tab. 11. H.*
15. The Echinus sinuatus.  
*Klein echinod. ap Leske, p. 157. tab. 12.*  
 In the chalk and limestone hills of *England*.
16. The Echinus semiglobosus.  
*Klein. echinod. ap Leske, p. 158. tab. 43. f. 1.*  
 In the calcareous mountains of *Silesia* and *Switzerland*.
17. The Echinus quinquelabiatus,  
*Klein. echinod. ap Leske. p. 158. tab. 43. f. 1.*  
 In the calcareous mountains of *Switzerland*.
18. The Echinus conoideus.  
*Leske ap Klein. echinod. p. 159. tab. 43. f. 2.*
19. The Echinus albo-galerus.  
*Leske ap Klein echinod. p. 162. tab. 13. A, B.*  
 In the chalk hills of *England*, and in marble in *Lower Saxony*.
20. The Echinus depressus.  
*Klein. ap Leske echinod. p. 164. tab. 40. f. 5, 6.*  
 In the chalk hills of *England* and *Lower Saxony*.
21. The Echinus vulgaris.  
*Klein ap Leske. p. 165. tab. 13. f. c--k. tab. 24. f. a--k.*  
*Luid Lithoph. Brit. n. 944--950.*  
*Echinites. Berkenhout syn. p. 272.*  
 Found abundantly in calcareous hills, in *England*, *Germany*,  
*Silesia*, &c.
22. The Echinus quadrifasciatus.  
*Klein. ap Leske echinod. p. 170. tab. 47. f. 3--5.*
23. The Echinus sexfasciatus.  
*Klein ap Leske echinod. 170. tab. 50. f. 1, 2.*
24. The Echinus subuculus.  
*Klein. ap Leske echinod. p. 171. tab. 14. f. 1--0.*
25. The Echinus scutatus.  
*Klein ap Leske echinod. p. 175. tab. 42. f. 2--4.*  
 In the chalk hills of *England* and *Denmark*.
26. The Echinus ovatus.  
*Klein. ap Leske. p. 178. tab. 53. f. 3. tab. 42. f. 5.*
27. The Echinus pustulosus.  
*Klein ap Leske echinod. p. 180. tab. 16. f. A, B.*  
 In the chalk hills of *England*, and in the marble rocks of *Germany*.

28. The Echinus quadrirad'atus.  
*Leske ap Klein. echinod. p. 182 tab. 4. f. 1.*  
 In the coarse marble of *Hallstein*.
29. The Echinus minor.  
*Leske ap Klein echinod. p. 183 t. 16. C, D. t. 17. a--d.*
30. The Echinus dubius  
*Leske ap Klein. echinod. p. 184 tab. 44. f. 5.*
31. The Echinus r'faceus.  
 In the mountains of *Languedoc*.
32. The Echinus altus  
*Leske ap klein. echinod. p. 189 tab. 53. f. 4.*
33. The Echinus orbiculatus.  
*Leske ap klein. echinod. p. 194. tab. 41. f. 2.*  
 In the calcareous mountains of *Switzerland*.
34. The Echinus subrotundus.  
*Andr Br. a. d. Schweiz. tab. 5. fig. g.*
35. The Echinus corollatus.  
*Leske ap klein. echinod. p. 209. tab. 40. f. 4.*
36. The Echinus Orbiculus.  
 In the republic of *Venice*, near *Bradenburg* in *Westphalia*, and in  
*Languedoc*.
37. The Echinus Placentæ.  
 In *Malta*.
38. The Echinus Cor anguinum.  
*Luid Lithoph. Brit. p. 47 n. 964--969. fig.*  
 In the chalk hills of *England*, and coarse marble rocks of  
*Germany*.
39. The Echinus lacunofus.  
*Scill corp. marin. t. 7. f. 1. t. 10 f. 4. t. 25. f. 2.*
40. The Echinus radiatus.  
*Leske ap kleine echinod. p. 234. tab. 25.*  
*Walch diluv. monum. p. 182. tab. E. 14. n. 1, 2.*
41. The Echinus complanatus.  
*Leske ap klein echinod. p. 238. tab. 51. f. 1, 2.*  
 In the limestone mountains of *Switzerland*.
42. The Echinus subglobulus.  
*Leske ap klein. echinod. p. 240. tab. 54 f. 2, 3.*  
 In the chalk hills of *England*, and marble of *Switzerland*.
43. The Echinus Ananchytis.  
*Leske ap klein. echinod. p. 243. tab. 53. f. 1, 2,*

## 44. The Echinus bicordatus.

*Andreæ Br a. d. Schw. p. 16. tab. 2. f. c.*

In the mountains of Switzerland.

## 45. The Echinus carinatus.

*Leske ap klein. echinod. p. 245. tab. 51. f. 2, 3.*

In Norway.

## 46. The Echinus Spatagus.

*Leske ap klein. echinod. p. 247. tab. 24. A, B. t. 26. A.*Found abundantly in the chalk hills of England, near *Mæßriß*, and in various parts of Germany and Switzerland.

## 47. The Echinus brissoides.

*Scill. corp. marin. tab. 10. fig. 1.*

## 48. The Echinus ovalis.

*Leske ap klein. echinod. p. 253. tab. 41. f. 5.*

In the mountains of Switzerland.

## 49. The Echinus pyriformis.

*Leske ap klein. echinod. p. 255. t. 44. f. 7. t. 51. f. 5, 6.*

## 50. The Echinus Lapis cancri.

*Leske ap kleine echinod. p. 256. t. 49. f. 10, 11.*

## 51. The Echinus patellaris.

*Leske ap klein. echinod. p. 256. t. 53. f. 5--7.*

## B. The parts.

## 1. The spines.

*Jew's-stones.**Helmintholithus judaicus. Syst. nat. 3. p. 169. n. 9.**Imperat. Hist. Nat 734. f. 1--4.**Volkman. Siles. 1. tab. 27. fig. 32.**Jew's stone. Berkenhout syn. p. 272.**Lluyd lithop. Brit. cap. 15. tab. 12.*

a. Thin, round, straight, cylindrical,

b. Thin, round, straight, conic.

c. Thin, round, incurved.

d. Thicker and finger-like.

e. Thicker and fusiform.

f. Thicker and 3-sided.

g. Thicker and clavate.

h. Resembling a small cucumber.

i. Resembling an olive or gland.

## 2. The knobs.

## 3. The separate compartments of the shell.



## 4. The teeth of the shell.

Found abundantly in *Great Britain*, and various parts of the globe: the spines are shorter or longer, smooth, striated, or studded.

*Chitonis.* The Chiton.

Near *Creazzo* in the *Venetian* territories.

*Lepadis.* The Lepas or acorn-shell.

## 1. The Lepas Balanus.

Near *Montaje* in *Piedmont* in sandstone, in *Malta*, *Languedoc*, and near *Dresden* in *Saxony*.

## 2. The Lepas balanoides.

In *Piedmont*, in sandstone.

## 3. The Lepas Tintinnabulum.

Near *Montaje* in *Piedmont*, in marble.

## 4. The Lepas Mitella.

Near *Montaje* in *Piedmont*, in marble.

*Pholadis.* The Pholas.

In the cliffs at *Harwich*, and in *Piedmont*, generally imbedded in silica or limestone.

*Musculites.* The Mya.

*Brand. foss. hant. fig. 95.*

*Lister Angl. 2. fig. 30.*

In *England*, *Arabia*, *Belgium*, *Switzerland*, *Germany*, *France*, and other parts of the continent.

*Solenites.* The Solen.

*Brand foss. hant. fig. 103.*

In many parts of *Glostershire*, in *Spain*, *Switzerland*, *Saxony*, *Germany*, &c. in lime or sandstone.

*Tellinites.* The Tellina.

*Brand foss. hant. fig. 89. 102.*

In *Glostershire*, *Italy*, *Switzerland*, *Bohemia*, *Austria*, &c. in clay or limestone.

## 1. The Tellina Lingua felis.

In the limestone mountains of *Switzerland* and *Wurtemberg*.

## 2. The Tellina rostrata.

In *Wurtemberg* near *Boll*, calcareous.

3. The Tellina Donacina.  
Near *Herbipolis*, in limestone.

*Bucardites*. The Cardium or Cockle.

*Brand foss. hant. fig 92 96. 98, 99.*

In the clay-pits at *Richmond* in *Surry*, at *Sherborne* in *Glocestershire*, in *Harwich* cliffs, *Shooter's hill*, and in vast masses of grey limestone near *Castle Saffron* in the county of *York*; in *Germany*, *Italy*, *Bobemia*, *Austria*, and other parts of the continent.

1. The Cardium Cardissa.  
Near the river *Leutha* in *Austria*.
2. The Cardium tuberculatum.  
In the mountains of *Transylvania*, in *Bobemia*, *France*, and near *Algeira* in *Barbary*.
3. The Cardium rusticum.  
In *Wurtemberg*, in swinestone.

*Mastra*. The Mastra.

In *Piedmont*, about *Verona* in *Italy*, in *England* and *Germany*, generally calcareous.

*Donacites*. The Donax.

1. The Donax Scortum.  
Near *Ringerheid* in *Westphalia*.
2. The Donax Irus.  
Near *Boll* in *Wurtemberg*, and in *Switzerland*.

*Veneris*. The Venus.

1. The Venus Dione.  
In *Switzerland*, *Wurtemberg*, *Franconia*, &c. calcareous.
2. The Venus Paphia.  
On the continent of *America*, in *Malta*, and *Alsace*.
3. The Venus Dysera.  
Near *Oedenburg* in *Hungary*.
4. Somewhat heart-shaped and quite smooth.  
In various parts of *England*, *Germany*, &c.
5. Somewhat heart-shaped and very finely striate.  
In *Staffordshire* and other parts of *England*, in *France*, *Germany*, *Austria*, &c. in clay or limestone.

6. Somewhat heart shaped and transversely grooved.  
Near *Boll* in *Wirtzburg*.
7. Somewhat heart shaped and tessellated.  
Near *Pfullingen* in *Wirtzburg*, and in *Switzerland*.
8. Somewhat heart-shaped and imbricate,  
In various parts of *France*.
9. Rounded and smooth.  
In *Oxfordshire* and other parts of *England*, in *Iceland*, *France*,  
*Italy*, *Germany*, *Austria*, *Switzerland*, &c. in clay, limestone,  
marle, or sand.
10. Rounded and very finely striate.  
In *Gloucestershire* and other parts of *England*, in *Saxony*, *Hungary*,  
*Austria*, *Germany*, *Bohemia*, *Switzerland*, &c. in chalk, lime-  
stone, or clay.
11. Rounded and wrinkled or plaited  
Near *Rome* in *Italy*, in *Germany*, *Switzerland*, &c.
12. Rounded and tessellated.  
Near *Mousson* in *Languedoc*, and at *Thalheim* in *Wirtzburg*.

*Spondyli.* The Spondylus.

1. The Spondylus Gædaropus.  
In *America*, *Switzerland*, *Flanders*, and *Germany*.
2. The Spondylus regius.  
In *Upper Austria* near the salt springs, in marble.

*Chamites.* The Chama.

*Brand. foss. bant. fig. 84--87. 100.*

1. The Chama Cor.  
Near *Bononia* in *Italy*, in *France*, *Austria*, *Bohemia*, and various  
parts of *Germany*.
2. The Chama Gigas.  
In *India*, and near *Heidenheim* in *Wirtzburg*.
3. The Chama Hippopus.  
Near *Verona* in *Italy*, and at the river *Quies* near *Naumburg* in  
*Silesia*, in sandstone.
4. The Chama caliculata.
5. The Chama Lazarus.

6. The Chama gryphoides.  
At *Weymouth*, in *Languedec*, near *Ratibon* and *Valcabanya*.
7. The Chama bicornis.  
Near *Montpellier* in *Languedec*, and at *Verdun* in *Lorraine*.
8. The Chama foliacea.  
In various parts of *France*.

#### *Arca.* The Arca.

*Brand. foss. hant. fig. 97. 101. 106.*

In the cliffs at *Harwich* and various parts of *Glocestershire* and *Oxfordshire*, and many parts of *Germany* and *Switzerland*.

1. The Arca Noë.  
In *Piedmont* and the *states of Venice*.
2. The Arca fossilis.  
*Schræt. n. Litterat. 2. fig. 3, 4;*  
In the *Dutchy of Limbourg*.
3. The Arca antiquata.  
In *South America*, and near *Valcabanya*.
4. The Arca granosa.  
In *Oxfordshire* and *Glocestershire*, and in *Hungary*.
5. The Arca Pestunculus.  
Near *Mæstricht*, in *marble*.
6. The Arca nummaria?  
In *Franconia*, *Wirttemberg*, and various parts of *Germany*.

#### *Ostrea.* The Ostrea, Oyster or Scallop shell.

*Brand foss. hant. fig. 83. 88. 107.*

*Lluyd Lithoph Brit. cap. 8, &c.*

In *Glocestershire*, *Berkshire*, *Oxfordshire*, and other places, in *Malta*, *Italy*, *Germany*, and most countries of *Europe*, in *chalk*, *flint*, *marble*, *clay*, *sandstone*, &c.

#### *A. Scallops.*

1. The Ostrea radiata.  
Near *Wimsey* and *Gravesend*, in *Germany*, &c.
2. The Ostrea maxima.  
In the *Venetian territories*, *Malta*, *Hungary*, *Austria*, *Bohemia*, *Germany*, &c.

## 3. The Ostrea Jacobæa.

In *Piedmont*, and various parts of *Germany* and the *Netherlands*.

## 4. The Ostrea Ziczac.

In the *Netherlands* and *Germany*.

## 5. The Ostrea minuta.

In *Austria* near *Brunn*, and near *Libochowitz* in *Bohemia*.

## 6. The Ostrea striata.

Near *Querfurt* in *Saxony*, and in *Hungary*.

## 7. The Ostrea Peuronectes.

In various parts of *Germany*,

## 8. The Ostrea Pallium.

In *Bohemia*, *Saxony*, *Switzerland* and *Germany*.

## 9. The Ostrea nodosa.

Near *Buckweiler* in *Alsace*.

## 10. The Ostrea Pusio.

In *Belgium*, *Germany*, and *Bohemia*.

## 11. The Ostrea glabra.

In *Germany* and *Bavaria*

## 12. The Ostrea fasciata.

Near *Odolca* in *Bohemia*.

## 13. The Ostrea Lima.

Near *Aristorf* in *Switzerland*.

## B. Oysters. In most parts of the globe.

## 1. The Ostrea diluviana.

*Helmintholithus diluvianus*. *Syst. nat.* p. 165. n. 8.  
*Ostrea indica*. *Duvil. curios.* 1. tab. 19. fig. X.

## 2. The Ostrea Folium.

## 3. The Ostrea edulis.

*Anomites.* The Anomia.

*Helmintholithus Anomiæ*. *Syst. nat.* p. 163. n. 4.

Very common in *England* and the continent.

## 1. The Anomia Craniolaris.

*Helmintholithus Craniolaris*. *Syst. nat.* p. 164. n. 6.  
*Faun. Succ.* 2150. fig. 2150. *AR. Ups.* 2. p. 560. tab. 2.  
*Nummus brattenburgensis*. *Stib. numogr.* 1732. f. 1, 2.  
 In various parts of *Sweden*.

2. The *Anomia pectinata*.  
*Syst. nat.* xii. 3. p. 163. n. 4. a.
3. The *Anomia Gryphus*. *Crow's-Ross.*  
*Helmintholithus Gryphites.* *Syst. nat.* p. 164. n. 7.  
*Concha lapidea.* *Column* ag 1. 52. *Bucc. obs.* 304. f. 1.  
*Conchites.* *Lifter Angl.* t. 4. f. 45. *Worm mus.* 80. f. 1.  
*Gryphites.* *Mus. Tess.* t. 5. f. 9. *Rumb. mus.* t. 59 B.  
 Found in *England, France, Germany, Switzerland, &c.* in gravel or clay-pits, sometimes with both the shells joined.
4. The *Anomia Pecten*.  
*Syst. nat.* xii. 3. p. 163. n. 4. b.  
 In *England, Germany, Saxony, &c.* rarely with both the shells, in gravel or clay-pits.
5. The *Anomia striatula*.  
*Syst. nat.* xii. 3. p. 163. n. 4. c.  
 Near *Wittney in Oxfordshire, in Bohemia, Germany and Switzerland*: shell about twice as wide as it is long.
6. The *Anomia reticularis*.  
*Syst. nat.* xii. 3. p. 163. n. 4. d. *Mus. Tess.* t. 5. f. 5.  
 In *Bohemia, Germany, France, and Hungary.*
7. The *Anomia plicatella*.  
 In mount *Tian berg* on the *Alps*, near *Blankenheim*, and in *Alsace*: marmoreous.
8. The *Anomia cuspida*.  
*Mus. Tessin.* tab. 5. fig. 7.  
 In the alpine parts of *Wirtemberg*, and near *Mebringen* and *Echterningen*; calcareous, rarely pyritaceous.
9. The *Anomia lacunosa*.  
*Mus. Tessin.* tab. 5. fig. 6.  
 In the *Hartz, Wirtemberg, Alsace*, and in *France*, marmoreous, rarely terruginous.
10. The *Anomia farsa*.  
*Syst. nat.* xii. 3. p. 163. n. 4.  
 In *Go bland* in *Sweden, France, and Austria*, marmoreous.
11. The *Anomia Caput Serpentis*.  
 Near *Benndorf*, marmoreous.

12. The Anomia Terebratula. *Terebratulites.*  
Found fixed or detached, in lime or flint, and sometimes filled with spar near *Witney* in *Oxfordshire* and at *Gravesend*, in *Germany*, *Saxony*, *Bohemia*, *Austria* and most parts of the continent.
13. The Anomia angulata.  
*Mus. Teflin. tab. 5. fig. 7.*  
In *Saxony* and the aips of *Wurtemberg*, and the mountainous parts of *Switzerland*.
14. The Anomia Hysterita. *Hysterolithus.*  
*Mus. Tefl. 40. tab. 50. f. 2. Worm mus. tab. 83.*  
*Wolf. Hals. 29. tab. 3 4. 5. Baum miner 1. tab. 28.*  
Found in various parts of *Germany*, *Sweden*, and *Saxony*, in flint or sandstone.
15. The Anomia biloba.  
In *England* and *Wurtemberg*, marmoreous.
16. The Anomia spinosa.  
On mount *Achalm* in *Wurtemberg*.
17. The Anomia novemstriata.  
*Syst. nat. xii. 3. p. 163 n. 4. 12.*
18. The Anomia echinita.  
In *Switzerland* and *Wurtemberg*.
19. The Anomia cristata.  
In *Wurtemberg* and other parts of *Germany*.
20. The Anomia Sandalium. *Sandalolithus.*  
In *Bohemia* and *Germany*, generally calcareous.
21. The Anomia Peridium. *Perdiolithus.*  
In the *Westphalian* circle of *Germany*.

*Mytilites.* The *Mytilus* or Muscle shell.

1. The *Mytilus Crista galli.*  
In *Malta*, *Normandy*, *Switzerland*, *Germany*, &c. generally marmoreous, and sometimes very large.
2. The *Mytilus Hyotis.*  
In *Switzerland* and *Waldenbeim*.

3. The *Mytilus Frons*.

Near *Christianstadt* in *Sweden*, in *Belgium*, *Normandy*, *Malta*, &c. in marble, sand or flint.

4. The *Mytilus margariferus*.

*Helmintholithus Androdamas*. *Syst. nat.* xii. 3. p. 165.

*Penna Pavonis*. *Mus. Tessin.* 24. n. 2.

Near *Aristorf* in *Switzerland*, opaque, but admitting a most beautiful polish, and exhibiting the most splendid iridescent colours according to its position in the light.

5. The *Mytilus Unguis*.

Near *Goslar* in the *Harz*, in clay.

6. The *Mytilus lithophagus*.

Near *Thalheim* in *Wurtemberg*.

7. The *Mytilus rugosus*.

Near *Varing* in *Austria*, marmoreous.

8. The *Mytilus edulis*.

In *Piedmont*, *Wurtemberg*, *Austria*, *Bohemia*, *Saxony*, &c. generally fixed and calcareous, sometimes ferruginous or in sandstone.

9. The *Mytilus angulatus*.

Near *Leipfic* in *Saxony*, marmoreous.

10. The *Mytilus Modiolus*.

In various parts of *Germany*, fixed and marmoreous.

11. The *Mytilus cygneus*.

Near *Thalheim* in *Wurtemberg*, large.

12. The *Mytilus anatinus*.

Near *Thalheim* in *Wurtemberg*, marmoreous.

13. The *Mytilus ruber*.

In *Switzerland* in shist, and *Saxony* in sandstone.

*Pinnites*. The *Pinna*.

In *Piedmont*, near *Aristorf* in *Switzerland*, in *Franconia*, and near *Pirnam* and *Dresden* in *Saxony*.



*Nautilus.* The Nautilus.

## 1. The shell spiral.

2. With the outer whorl of the shell much larger than the others.  
 Very common in *Northamptonshire, Kent, Sheppey* and other parts of *England, in France, Germany, Italy, Saxony, Switzerland, Austria, &c.* generally marmoreous, sometimes pyritaceous or siliceous.

## b. With the whorls of the spire gradually decreasing inwardly.

*Cornu Ammonis. Serpent-stone, Snake-stone.*

*Helmintholithus Nautili. Syst. nat. xii. 3. p. 162. n. 1.*

*Cornu Ammonis. Wolf. Hals. tab. 7. f. 1—3. t. 8. f. 6.*

*Helmintholithus Nautili. Mus. Tassin. 86. tab. 4.*

*Ammonites. Gesner petrif. 47. Gesn. fig. 164. f. 4.*

*Sowerby British minerals. tab. 12.*

1. With the circumference acute and entire, the disk compressed, and the sutures flexuous. *Mus. Tassin. fig. 11.*

2. With the circumference carinate and entire, the disk compressed, and the grooves cloven. *Mus. Tassin. f. 10.*

3. With the circumference carinate and crenate, the grooves of the disk elevated and remote. *Mus. Tassin. fig. 9.*

4. With the circumference obtuse, the disk a little compressed and striate. *Mus. Tassin. fig. 7.*

5. With the circumference obtuse, the disk compressed, and the grooves of the back cloven. *Mus. Tassin. fig. 2.*

6. With the circumference depressed, and the sides of the disk knotty. *Mus. Tassin. fig. 8.*

7. With the circumference depressed, and the disk with acute striæ. *Mus. Tassin. fig. 3.*

8. With the circumference somewhat square and carinate, and the grooves acute and remote. *Mus. Tassin. pl. n. d.*

9. With the circumference rounded and knotty, and the grooves transverse and flexuous. *Mus. Tassin. fig. 1.*

Found in almost every part of the globe in marble, limestone, clay, marl, sandstone, hornstone, slate, flint, &c. from the size of a sixpence to more than a foot in diameter: the chambers are often filled with crystals of various kinds.

## c. The Helicite.

Found in *Lapland, France, Spain, Italy, Hungary, Austria, Switzerland, &c.* in limestone, detached or fixed, solitary or aggregate.

2. Elongated and more or less straight.

a. The Nautilus Lituus.

In Sweden, Normandy, Bohemia, Italy, &c. in limestone.

b. The Nautilus Orthoceras.

Helminth. nautili orthoc. *Syst. nat.* xii. 3. p. 162. n. 2.

Alveolus. *Scheuch. diluv.* 938. *Helv.* 7. f. 8.

Tubulus concameratus. *Klein. Tubul.* 7. tab. 2--8.

Found solitary or aggregate, detached or fixed, in England, France, Sweden, Siberia, Germany, Bohemia, &c. in limestone, spar, marble, sandstone, or other minerals.

c. The Nautilus Belemnita, Thunderbolt, Thunderstone.

Helmintholithus Alcyoni. *Syst. nat.* xii. 3. p. 170. n. 22.

Tubulus marinus. *Klein. gedan.* 1731. 4. t. 7, 8, 9.

Belemnites. *Rumph. mus.* tab. 50. fig. 1—5.

Belemnites. *Breyn polyth.* 41. f. 1 7.

Belemnites. *Gesn. fig.* 91. *Erbart diss.* 1727. 4. f. 2.

Very frequent in many parts of England, particularly in Gloucestershire and Oxfordshire, and in most mountainous parts of Europe: they are more or less opaque or transparent, straight or a little bowed, cylindrical, conic, more or less clavate, fusiform, a little compressed, pointed or rather obtuse, with a groove or two towards the tip, internally hollow or filled up, from a quarter of an inch to 8 inches long: colour whitish, amber colour, grey, brownish or blackish: they are often inclosed in or adhere to other stones, and are composed of several crusts encircling each other, and are most frequent in chalk, gravel or clay: when burnt or scraped with a knife, they give out an odour like rasped horn. The country people have a notion that they are also to be found after a thunder-storm.

Coni. The Conus.

In Piedmont, Switzerland, and Transylvania, most commonly a marble nucleus.

Porcellanites. The Cypræa or Cowrie.

In Piedmont and Austria, marmoreous.

Bullites. The Bulla.

Near Nothberg in Germany.

*Cylindrites.* The Voluta.

Generally a marble nucleus in *Switzerland*, *Piedmont*, near *Verona*, in *Austria*, *Saxony*, and *Germany*.

*Buccini.* The Buccinum or Whelk.

1. Inflated.

In *Westphalia*, near *Rotenburg*, *Ludenburg*, *Galgenburg*, *Hartenburg* and *Gravenberg*.

2. Tailed.

On Mount *Cria* in *Italy*, marmoreous.

3. Angular. The Buccinum Bezoar.

On the Hills near *Hampton* in *England*, in *Belgium*, *Switzerland*, *Austria*, *Hungary*, *Germany*, &c.

4. The Buccinum Harpa.

In *Piedmont*.

5. The Buccinum marginatum.

*Martin Conch.* 3. tab. 120. fig. 1099. 1100.

In *Piedmont*.

6. Subulate and smooth.

In *Italy*, *Germany*, *Switzerland*, *Franconia*, *Saxony*, *Sweden*, *Prussia*, &c. generally a marble nucleus.

*Strombi.* The Strombus.

1. Digitated.

a. The Strombus Chiragra.

Near *Oedenburg* in *Hungary*, marmoreous.

2. Lobed. *Alatites*.

a. The Strombus lentiginosus,

Near *Oedenburg* in *Hungary*, marmoreous.

b. The Strombus sinister.

In *Switzerland*.

3. Dilated.

a. The Strombus Lucifer.

4. With a very long spire.

Near the warm baths in *Wirtemberg*.

*Muricis.* The Murex or Whelk.

## 1. Spinous.

## a. The Murex triacanthus.

*Walch. Petrefact. 2. 1. p. 118. tab. C. 1. fig. 5.*Near the salt springs in *Upper Austria*, very rare.

## 2. Frondose.

In *Temesia*.

## 3. With an elongated spire.

## a. The Murex fuscatus.

In the *Venetian* territories, marmoreous.

## b. The Murex granulatus.

In *Italy* and *Austria*, marmoreous or filled with sandstone.*Trochilites.* The Trochus or Top-shell.

## 1. Conic.

Near *Bath*, in *Denmark*, *Sweden*, *Norway*, *Saxony*, *Germany*, &c. generally in lime or sandstone.

## a. The Trochus zizyphinus.

Near *Pfullingham* in *Wurtemberg*.

## 2. Convex.

In *Italy*, mostly marmoreous, rarely siliceous.

## a. The Trochus perspectivus.

In *Franconia*.

## 3. The Trochus Telescopium.

Near *Brendola* in the *Venetian* territories.*Turbinites.* The Turbo.

## 1. Solid.

In *Piedmont*, *Westphalia*, and many parts of *Germany*, generally in marble, quartz or sandstone.

## a. The Turbo littoreus.

In *Switzerland* and many parts of *Germany*, sometimes filled with spar, or covered with arboresecent figures.

## b. The Turbo Cochlus.

Near *Diesenhof* in *Switzerland*.

## c. The Turbo rugosus.

In *Belgium* and *Franconia*.

- d. The Turbo marmoratus.  
Near *Thalheim* and *Boll* in *Wirtemberg*.
- e. The Turbo sarmaticus and argyrostomus.  
Near *Pfullingen* in *Wirtemberg*.
2. Cancellate.
  - a. The Turbo scalaris.  
Found in *Switzerland* on mount *Hexenburg*, rare.
  - b. The Turbo striatulus.  
Near *Schemnitz* in *Hungary*, marmoreous.
3. With an elongated spire.  
In *England*, *France*, *Switzerland*, *Italy*, *Silesia*, *Bohemia*, *Saxony*, *Germany*, &c. aggregate and fixed, generally in marble, flint, chalcedon or sandstone, and sometimes filled with spar.
  - a. The Turbo imbricatus.  
In *France*, *Tyrol*, and *Bohemia*, in marble or swinestone.
  - b. The Turbo replicatus.  
In *France*, marmoreous.
  - c. The Turbo acutangulus.  
Near *Palermo* in *Sicily*, in marl.
  - d. The Turbo exoletus.  
In *Piedmont*, in marble.
  - e. The Turbo Terebra.  
In *Bavaria*, in marble.
  - f. The Turbo variegatus.  
Near *Blankenburg* in the *Harz*, in marble.

# *Helicis.*

## The Helix or snail-shell.

1. Flattened.  
In various parts of *England*, *Belgium*, *Switzerland*, *Hungary*, *Germany*, &c. detached or fixed, solitary or gregarious or mixed, in marble, flint or sandstone.
2. Rounded.  
Near *Verona* in the *Venetian* territories, in *Piedmont*, *Switzerland*, and *Germany*.
3. Ovate with a point.  
In *England*, *France*, *Germany*, *Switzerland*, *Austria*, *Bohemia*, *Saxony*, &c. in marble or sandstone.

**Neritites.** The Nerita.

In *Piedmont, Switzerland, Carinthia, Austria, Germany, &c.*  
generally in limestone.

**auricularis.** The Haliotis or sea-ear.

In *Temesia* and *Belgium*.

## 1. The Haliotis perversa.

*Martin. n. Mannigf. 4. p. 404. tab. 1. fig. 3.*

## 2. The Haliotis plicata.

*Schræt. einl. in Verst. 4. p. 278. tab. 3. fig. 9.*

**Patellariæ.** The Patellaria or limpet.

In various parts of *England, Switzerland, and Italy*.

## 1. The Patellaria saccharina.

*Conchidium. Mus. Tetsin. 90. tab. 5. fig. 8.*

Common in various parts of *Sweden*.

**Dentalis.** The Dentalium or tooth-shell.

In various parts of *Italy, Switzerland, Germany, Bohemia, Silesia,*  
and *Saxony*, in marble, jasper or chalcedony.

## 1. The Dentalium Radula.

## 2. The Dentalium interruptum.

## 3. The Dentalium vitreum.

All found in *Piedmont*.

## 4. The Dentalium sexangulare.

Near *Loretto* in *Italy*.

**Tubulites.** The Serpula.

## 1. Straight or nearly so.

In *Germany* and *Belgium*.

2. Flexuous or contorted, *Vermiculites*.

In *Malta, Italy, Switzerland, Germany, Franconia, and Belgium*,  
in marble or sandstone, generally seated on other petrified  
shells.

## a. The Serpula Spirillum.

In the island of *Sheppey* and *Wirttemberg*.

## b. The Serpula filigrana.

Near *Halam* in *Magdeburg*, rare.

## c. The Serpula glomerata.

In *Silesia* and *Switzerland*.

d. The *Serpula lumbricalis*.  
Near *Grancona* in the *Venetian* territories.

e. The *Serpula arenaria*.

f. The *Serpula anguina*.  
Both near *Norimburg* in *Franconia*.

g. The *Serpula melitenfis*.  
In *Malta*. *Schrætt. Conch.* 2. p. 570. tab. 6. f. 19.

*Teredinis*. The *Teredo*.  
In *Sheppey* island and *Piedmont*, in subterraneous wood.

*Sabellæ*. The *Sabella*.  
Found every where among impressions.

*Tubiporites*. The *Tubipore*.  
*Helmintholithus Tubiporus*. *Syst. nat.* xii. 3. p. 167. n. 13.  
In *Sweden*, *Belgium*, *Franconia* and *Silesia*.

1. The *Tubipora musica*.

In *England*, *Belgium*, *Germany* and *Gothland*, in marble, quartz or sandstone.

2. The *Tubipora catenularia*.

In *Gothland* and *Brandenburg*, marmoreous.

3. The *Tubipora Serpens*.

4. The *Tubipora fascicularis*.

5. The *Tubipora stellata*.

6. The *Tubipora Strues*. In *Prussia*.

*Madrepores*. The *Madrepore*.  
*Helmintholithus Madreporus*. *Syst. nat.* xii. 3. p. 167. n. 14.  
In *Gothland*, *Belgium*, *Piedmont*, and the *Venetian* territories, in beds of marl.

1. The *Madrepora verrucaria*.

In the *Venetian* territories, marmoreous.

2. The *Madrepora turbinata*.

In *Derbyshire*, *Gothland*, *Switzerland*, *Austria*, and various parts of *Germany* and the *Netherlands*, in marble.

3. The Madrepora Porpita.  
In *Switzerland, Austria, Saxony, and Westphalia*, generally detached, in marble, jasper and flint.
4. The Madrepora Fungites.  
In the *Netherlands, the Harz, Austria, Switzerland, &c.* generally in marble, rarely in flint.
5. The Madrepora Pileus.  
In *Gothland, Bohemia, Wirtemberg, and Switzerland*, in marble, rarely in quartz.
6. The Madrepora Agaricipes.  
In the *Netherlands*.
7. The Madrepora labyrinthica.  
In *Gothland, Belgium*, and near the salt springs in *Austria*, in limestone.
8. The Madrepora Meandrites.  
In *Switzerland*, mostly in marble.
9. The Madrepora Areola.
10. The Madrepora favosa.  
In *Switzerland, Upper Austria, Wirtemberg and Westphalia*, marmoreous.
11. The Madrepora Ananas.  
In the mountains of *Gothland*, marmoreous.
12. The Madrepora polygama.  
Near the salt springs in *Upper Austria*, marmoreous.
13. The Madrepora arenosa.  
In *Upper Austria*, marmoreous.
14. The Madrepora foliosa.  
In the *Netherlands*.
15. The Madrepora Astroites.  
In *Oxfordshire* near *Heddington* and *Wittney*, in the *Netherlands, Germany, Austria, Saxony, &c.* in chalk, chalcedony or sandstone.
16. The Madrepora calycularis.  
Near *Keldenig* on mount *Danzberg*.
17. The Madrepora truncata.  
In *Upper Austria*, marmoreous.
18. The Madrepora stellaris.  
Near *Herkelstein* in *Eifalia*.
19. Madrepora Organum. *Syst, nat.* 26.



20. The *Madrepora muscicalis*.  
*Lluid Lithoph. Brit. tab. 25. fig. 104.*  
*In England, France, Bobemia, and the Netherlands.*
21. The *Madrepora divergens*.  
*In Egypt.*
22. The *Madrepora cæspitosa*.  
*In Derbyshire, Switzerland, Austria and various parts of Germany,*  
*in marble or flint.*
23. The *Madrepora flexuosa*.  
*In Derbyshire.*
24. The *Madrepora fascicularis*.  
*On an American island opposite Caracas.*
25. The *Madrepora pectinata*.  
*In Silesia, and upper Burgandy.*
26. The *Madrepora tubularis*.
27. The *Madrepora mamillaris*.  
*In the Netherlands and Burgandy.*
28. The *Madrepora patelloides*.
29. The *Madrepora globularis*.
30. The *Madrepora Filum*.  
*Near Basil in Switzerland.*
31. The *Madrepora vermicularis*.  
*In Silesia and Switzerland.*
32. The *Madrepora arachnoides*.  
*In the Netherlands, Wirtemberg, and upper Austria.*
33. The *Madrepora undulata*.
34. The *Madrepora Monile*.  
*Near Djidda in Egypt.*
35. The *Madrepora Porites*.  
*In Sweden, Silesia, and France.*
36. The *Madrepora damicornis*.  
*In Carniola and Upper Austria.*
37. The *Madrepora muricata*.  
*In Gothland and Silesia, marmoreous.*
38. The *Madrepora fastigiata*.  
*In Silesia and upper Austria, marmoreous.*
39. The *Madrepora ramea*.  
*In the alps of Wirtemberg, siliceous or marmoreous.*

40. The *Madrepora oculata*.  
In *Gothland*.
41. The *Madrepora Cactus*.
42. The *Madrepora concamerata*.

*Milleporites* The Millepore.

In *Italy*, on mount *Randberg* in *Switzerland*.

1. The *Millepora alcicornis*.  
In the *Netherlands*, *Germany* and *Sweden*, marmoreous.
2. The *Millepora aspera*.  
In the circle of *Westphalia*.
3. The *Millepora solida*.  
In *Sweden* and *Gothland*, near *Heidenheim* in *Westphalia*, and near *Cormons* in *Carniola*.
4. The *Millepora pumila*.
5. The *Millepora reticulata*.  
Near *Kebinghausen* in *Germany*.
6. The *Millepora cellulosa*.
7. The *Millepora Spongites*.  
*Helmintholithus ramosus*. *Syst. nat.* 3. p. 167.  
*Corallinum ramosum*. *Mus. Tesei. tab.* 11. fig. 12.
8. The *Millepora coriacea*.  
In *Gothland*, *Silesia* and *Switzerland*.
9. The *Millepora polymorpha*.  
In *Silesia* and *Switzerland*.
10. The *Millepora ignota*.  
*Helmintholith. milleporæ*. *Syst. nat.* xii. 3. p. 167. n. 15.

*Celleporites*. The Cellepore.

1. The *Cellepora Spongites*.
2. The *Cellepora pumicosa*.
3. The *Cellepora verrucosa*.  
In *Gothland* and the principality of *Hulberstadt*, in marble or sandstone.

*Isidis.*

The Isis or Coral.

1. The Isis Hippuris.

The single joints are often found in *England, Switzerland and Sicily.*

2. The Isis Entrocha.

Helminth. Entrochites. *Syst. nat.* xii. 3. p. 168. n. 17.

Alteria columnaris. *Harenb. encrin.* t. 1. f. 8--10.

Entrochus. *Volm. Silef.* 1. tab. 27. fig. 9, 10.

Found in *England* and almost every part of the continent, sometimes in single separate joints, sometimes connected together into a column, from the size of a pin's head to a finger's length and the thickness of the middle-finger: they are more or less transparent in proportion as they contain more or less silica, are striated from the centre to the circumference and have a cavity in the middle. When powdered they are esteemed very powerful diuretic, and are exhibited in nephritic cases; the dose being as much as will lie on a shilling.

- a. Smooth, with the margin nearly entire.
- b. Smooth, with the margin undulately scalloped.
- c. Warty.
- d. Prickly.
- e. Dotted.
- f. Transversely striate.
- g. With the joints elevated.
- h. Branched in a forked manner.

3. The Madrepora Alteria.

*Star-Bone.*

- a. With the angles more or less obtuse.

Helminthol. Alteria. *Syst. nat.* xii. 3. p. 168. n. 18.

Modiolus stellatus. *Scheuch Helv.* 10 fig. 3.

Modiolus stellatus. *Lang. fig.* 67 tab. 19 f. 2.

Alteria pentagona. *Rosin stell* 35. tab. 5.

Alteria columna. *Gesner fig* 37. *Volkm. silef.* t. 27. f. 22.

*Lluyd lithop. Brit.* tab. 13. 22.

- b. With the angles acute.

Helminthol. Stella. *Syst. nat.* xii. 3. p. 169. n. 19.

Lapis judaicus. *Wagn. Judaic.* 11. fig. 27.

- c. Orbicular.
- d. Orbicular at one end and angular at the other.

In *England, Switzerland, Germany, Austria, &c.* single or gregarious, detached or fixed, with the joints solitary or forming a column which is rarely curved or branched, smooth or warty, rarely 3 or 6-sided, very rarely square: the joints when separated resemble a radiated star: when placed in good vinegar they have the property of moving, which is merely occasioned by the effervescence caused by the acid acting upon the calcareous matter of which they are composed.

4. With the divisions distant, orbicular, and connected by a central thread.

*Syst. nat.* xii. 3. p. 170. n. 24. *Hamb. mag.* 9. p. 73.

Near *Bristol* and in *Derbyshire*, in the *Harz* and various parts of *Germany*, in marble or quartz or flint, and often containing a large portion of oxyde of iron.

5. Turbinate, with a 5-sided 5 toothed border.

*Syst. nat.* xii. 3. p. 169. n. 22.

*Carpolithus.* *Mus. Tess.* 96. tab. 4. fig. 2.

*Caryophyllus lapideus.* *Vogel mineral.* 234.

On mount *Randberg* in *Switzerland*, detached, of various sizes, and sometimes on a stem.

### *Gorgoniae.* The Gorgonia.

1. Branched.

In the principality of *Neocomum*, marmoreous.

2. The Gorgonia nobilis.

In *Switzerland*, and near *Verona* in *Italy*.

2. Reticulate.

Near *Dresden* in *Saxony*, and *Cosers* in *Bohemia*, in marl or swine-stone; sometimes only an impression.

### *Alcyonii.* The Alcyonium.

1. The Alcyonium arboreum.

In *England, Bohemia, and Austria*.

2. The Alcyonium exos.

In the *Netherlands, Germany* and *Switzerland*, calcareous, entire or in parts.

3. The Alcyonium digitatum.

In *Switzerland* and *Basil*, marmoreous.

4. The Alcyonium Lyncurium.

On mount *Randberg* in *Switzerland*.

5. The Alcyonium Bursa?

Near *Preßingen* in *Switzerland*.

6. The Alcyonium Cydonium.

Near *Pfeffingen* in *Switzerland*.

7. The Alcyonium Ficus.  
In the *Netherlands*.
8. The Alcyonium gelatinosum.  
In the *Westphalian* circle of *Germany*.

- Spongiæ.* The Spongia or sponge.
1. The Spongia crateriformis?  
Near *Paffrath* in *Switzerland*.
  2. The Spongia Tupha?  
In *Franconia*.

- Escharites.* The Flustra.
- In the *Netherlands*, *Franconia*, and *Switzerland*, of sandstone or calcareous.
1. Porous on both sides.
    - a. The Flustra foliacea.
    - b. The Flustra truncata.  
Both in *Hesse*.
    - c. The Flustra pilosa.  
In the *Netherlands* and the *Dutchy of Montano*.
    - d. The Flustra lutosa,  
At *Basil* in *Switzerland*.
  2. Porous on one side only.  
In *Gothland*, marmoreous.

- Tubulariæ.* The Tubularia.
- In *Gothland* and *Switzerland*, marmoreous or arenarious.
1. The Tabularia indivisa.

- Corallinæ.* The Corallina.
- In *Bohemia* and *Venice*, the impression.
1. The Corallina corniculata.
  2. The Corallina barbata.

- Sertulariæ.* The Sertularia.
- In *France* and the *Netherlands*, the impression.

- Pennatulæ.* The Pennatula or sea-pen.
1. The Pennatula phosphorea.  
In the *Netherlands* and on mount *Baldo* in *Verona*, the impression.

## 2. The Pennatula Encrinurus,

## a. Expanded.

Helminth. portentos. *Syst. nat.* xii. 3. p. 169. n. 20.

Caput Medusæ. *Hiemer Cap. Med.* 1724. 4. tab. 1.

Caput Medusæ *Ad Lipp.* 1725 p. 376. fig.

*Luid lithop. Brit. epist.* 6. p. 142. fig.

In *England, Wirtemberg, Bohemia, Germany, &c.* in marl or flint, sometimes the impression only.

b. Contracted. *Stone lity.*

Helminth Encrinus *Syst. nat.* xii. 3. p. 169. n. 21.

Encrinurites. *Davil. curios.* 3. tab. 1.

Encrinus. *Hanrenb. encrin.* 1229. t. 1. f. 1. 3. 4. 7.

Lilum lapideum. *Ritter geol. tab.* 1. fig. 1.

*Luid Lithoph Brit. epist.* 1. p. 101. fig.

*Parkinson's Organic Rem. frontispiece.*

*Ellis Corall.* p. 99. tab. 37. K.

Found entire or in parts in *England, Switzerland, Saxony, Germany, &c.*

## 3. The Pennatula Cynomorion.

On mount *Randberg* in *Switzerland*.

## 110. PHYTOLITHUS. A vegetable, or some of its parts, changed into a fossil substance.

*totallis.*

## The whole plant,

In various parts of *Great-Britain*, most commonly in the shale lying over strata of coals or in sandstone, and in various parts of *Europe*; it is always in the form of an impression.

## 1. The Hippuris or Mare's-tail.

In the coal-mines of *Silesia* and *Germany*.

## 2. The Chara.

## 3. The Salvia or Sage.

## 4. The Iris.

Near *Alais* in *Languedoc*.

## 5. Various Grasses.

In *Switzerland, Bohemia, Silesia*, and various parts of *Germany*, in shift or swinestone and alumina lying over beds of coal, rarely in flint.

## a. The Alopecurus or Foxtail grass.

## b. The Triticum repens or Couch-grass.

6. Stellate plants, as *Galium*, *Asperula*, &c.  
In the coal-pits of *England*, *France*, *Germany*, &c.
7. The *Myosotis scorpioides* or Mouse-ear Scorpion-grass.
8. The *Pulmonaria* or Lungwort.  
In the coal-pits of *France*.
9. The *Athamanta* or Stone-parsley.  
In *Westphalia* and *Silesia*.
10. The *Laserpitium* or Lazar-wort.  
In *Shropshire* near *Colebrook dale*.
11. The *Chærophyllum* or Chervil.  
In *Silesia* and *Westphalia*.
12. The *Anethum fœniculum* or Fennel.  
In upper *Austria* and *Westphalia*.
13. The *Herniaria* or Rupture-wort.
14. The *Erica* or Heath.  
In various parts of *France*.
15. The *Euphorbia* or Spurge.  
In *Silesia* and *Westphalia*, in alumina.
16. The *Cactus*.  
In *England*, *Westphalia* and *Germany*, in coal-mines.
17. The *Nigella* or Fennel-flower.  
In *Silesia*.
18. Various species of *Anemone*.  
In the coal-mines of *France*.
19. The *Geranium*.  
In *Languedoc*, near *Alais*.
20. The *Zostera* or Grass-wrack.  
In *France* and *Italy*, in marl.
21. The *Fumaria* or Fumitory.  
In *Westphalia*, in stictose alumina.
22. The *Vicia* or Vetch.  
In the coal-mines of *Westphalia*.
23. The *Ornithopodium* or Bird's-foot.  
In the Veronese mountains of *Venice*.
24. The *Galega* or Goat's-rue.  
In the Veronese mountains of *Venice*.

25. Various plants of the Syngenesia class, as *Inula*, *Aster*, *Crysanthemum*, *Centaurea*, *Cyanus*, &c.  
In *Silesia*, the *Harz*, and *Languedoc*.
26. The *Buxus* or Box.  
In various parts of *Westphalia*, in shistose swinestone and bituminous marl.
27. The *Mariophyllum* or Water Millefoil.  
In *England*, and near *Mannbach* in *Silesia*.
28. The *Ceratophyllum* or Hornwort.  
In *England* and *Silesia*.
29. The *Pinus* or Pine.  
In *Switzerland*, and various parts of *Westphalia*.
30. Various Genera and species of Ferns, as *Equisetum*, *Osmundia*, *Achrosticum*, *Pteris*, *Asplenium*, *Polypodium*, *Adiantum*, &c.  
*Phytol. filicis.* *Syl. nat.* xii. 3. p. 171. n. 2.  
*Filix petrefacta.* *Volkm. filic. t. 1. f. 22. t. 12. f. 1—5*, &c.  
*Luid Lithoph. Brit. tab. 4, 5.*  
In shistose and bituminous marl and alumina covering veins of coal, in sandstone and other fossils, in very numerous varieties, in many parts of *Great-Britain*, *France*, *Germany*, *Italy*, *Bohemia*, *Saxony*, and most parts of *Europe*; generally impressions.
31. Various Mosses and Sea-weeds.  
In *Venice*, *Saxony*, and *Silesia*.

*Rhizolithus.* The roots of vegetables.

Most commonly found under-ground in a state of decay, sometimes hollow or filled with other fossile substance; sometimes covered with a stony crust; though sometimes it occurs petrified in *France*, *Italy*, *Hungary*, *Bohemia*, *Sweden*, *Siberia*, *Germany*, &c.

*Trunci.* The trunk or stalk of vegetables.

1. The stalks of herbs.  
Near *Dresden* and *Brunswick*, the impression.
2. The culms of grasses.  
In *Hungary*, *Silesia*, *Germany*, &c. in bituminous marl and shistose swinestone.
3. The trunks of trees. *Lytboxylon.*  
In almost every part of the *Globe*, and in various states of decay and appearance; sometimes forming subterraneous woods,



the pieces of which are found or carious or perforated by the *Teredo*, converted in charcoal, with or without the bark, and often so perfect as to distinguish the kind, as Oak, Ash, Fir, &c.

- a. Marmoreous and often filled with spar.  
In *Ireland*, *Brandenburg*, *Bohemia*, *Hungary*, *Saxony*, *Germany*, &c.
- b. In swinestone.  
Near *Boll* in *Wurtemberg*.
- c. In Gypsum.  
In *Bohemia* and *Piedmont*.
- d. In Alumina.  
Near *Creuz* in lower *Hungary*.
- e. In Silica.  
In *England*, *Ireland* at *Loughneagh*, *Italy*, *Switzerland*, *Hungary*, *Germany*, *Saxony*, *Austria*, &c.
- f. In Agate.  
*Holzstein*. *Karst. Leske miner.* 1. p. 136.  
In *Siberia*, *Hungary*, and *Saxony*, more or less opaque, breaking into coarse splinters or indeterminate fragments, a little shining, taking a fine polish, fibrous internally, of a conchoidal texture, variegated, spotted or striate, blackish or smoke-colour, sometimes red, ochraceous or green.
- g. In Opal.  
*Holzopal*. *Karsten Leske miner.* 1. p. 170.  
In upper *Hungary*, hardish, opaque or nearly so, breaking into indeterminate fragments or long splinters, separating into crusts, generally a little shining, mostly variegated with white, greyish, brown, or ochraceous and hyacinthine in alternate streaks.
- h. In Sandstone.  
In *Silezia*, *Bohemia*, *Germany*, &c.
- i. In Alumina.  
Sometimes forming large strata, in *England*, *Sweden*, *Saxony*, *Bohemia*, *Austria*, *Piedmont*, &c.
- k. Combined with sulphate of iron.  
In *Prussia* in the strata superincumbent on amber, and near *Boll* in *Wurtemberg*.
- l. Combined with sulphate of copper.  
Near *Herrngrund* in lower *Hungary*.
- m. Bituminous.  
Frequently forming entire subterranean woods in various parts of *England* and *Ireland*, particularly in *Lincolnshire*, in *Russia*, *Sweden*, *Denmark*, *France*, *Spain*, *Holland*, *Flanders*, *Germany*, *Prussia* in strata superincumbent on amber, *Saxony*, *Bohemia*, *Austria*, *Italy*, and *Switzerland*.

## n. Pyritaceous.

In *Lorrain, Saxony, Franconia, and Wirtemberg.*

## o. Combined with oxyde of iron.

In *Switzerland, Hungary, Bohemia, and Germany.*

## p. Combined with oxyde of copper.

In *Siberia and Sweden.*

*Lithophyl-  
lum.*

The leaves of plants.

Impressions of the leaves of various herbs and trees very frequent in marble, shist, marl, clay, and sandstone, rarely in flint or indurated oxyde of iron.

*Antholi-  
thus,*

The flowers of plants.

1. The spikes of grasses, as the *Phalaris bulbosa*, *Spica frumenti*. *Wolf. Haf sub tab 5. fig. 5.*

In *Silesia, Franconia and Germany*, in copper ores, with often a small admixture of silver.

2. The flowers of herbs, as the *galium*, *heliotropium*, *al'fines*, *ranunculus*, *myagrum*, *aster*, *centauria*, and various ferns.

In *England, Silesia, Germany, Switzerland, &c.* impressions found between various flaty stones.

*Carpoli-  
thus.*

The naked seeds, seed-vessels, cones, nuts, drupes, and legumes of plants.

In the coal-mines of *England*, in sandstone in *Piedmont*, in *Bohemia* in marl, in *Switzerland* in turf, in *Hungary, Austria, &c.* always impressions.

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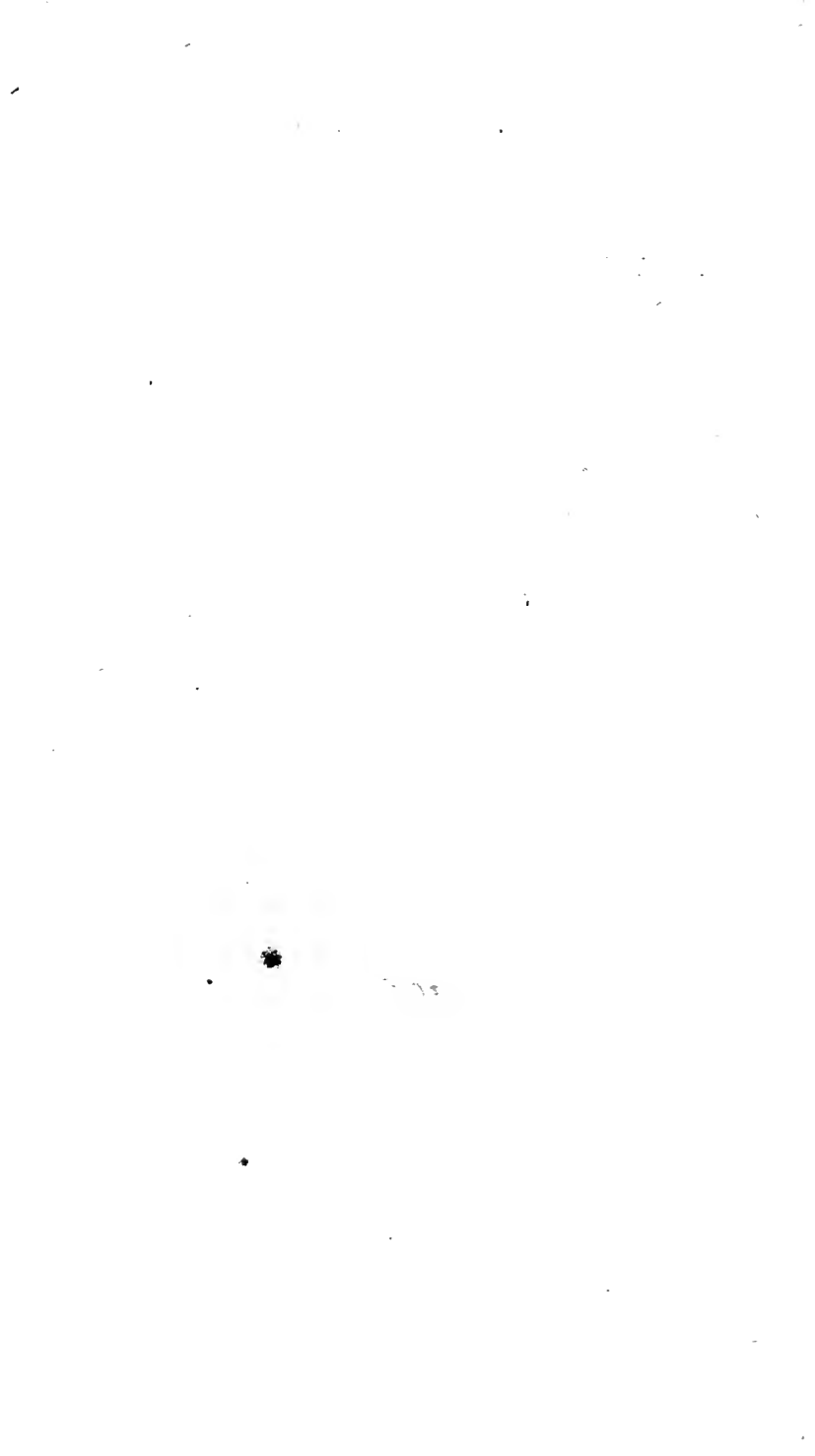
SOME  
ACCOUNT  
OF THE  
*LIFE AND WRITINGS*

OF

SIR CHARLES LINNE,  
KNIGHT OF THE POLAR STAR.

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VOL. VII. — Y y



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SOME ACCOUNT OF THE LIFE AND WRITINGS

OF

SIR CHARLES LINNE,

KNIGHT OF THE POLAR STAR.

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OF this great luminary of natural science, born to lift up the awful veil of nature, and to give a permanently systematic arrangement of her materials, whatever can now be known has been collected with much diligence by Dr. Pultney and Dr. Stœver: and it is principally from these and other sources that the following sketch has been derived.

Charles Von Linné was born on the twenty-fourth of May,† 1707, at Roeshult, a small village in the province of Smaland in Sweden. The remotest knowledge we have of his direct ancestry is derived from Bengé Ingemarson, a peasant in the parish of Hwitaryd.

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† In Mr. Trapp's translation of Stœver's life, he is said to have been born on the third of May.

His issue was a son born in 1633, farmer of the manor of Erickstad, and who by a transposition of names was called Ingemar Bengeston: he was the grandfather of Linné. His son, Nicholas Linnæus, the father of Linné, was born in 1764, and being the first learned man of his family, took his name from a Tilia or linden tree which grew in the neighbourhood of his native place, and from which some other branches of his family had derived theirs. He was pastor of the village where he resided, and married Christiana Broderfon the daughter of his predecessor in office. By her he had issue Charles their first born; Anna Maria who married Gabriel Hoek rector of Wirestadt; Sophia Juliana who married John Collin rector of Ryfby: Samuel who was born in 1718, and married the daughter of Nicholas Osander prebendary of Makaryd, and who succeeded his father in the rectory and prebendary of Stenbrohult. He has several daughters.

The retirement and leisure which his function afforded him, and probably the slenderness of his income, had given the father a great attachment to husbandry and gardening: and hence might spring the bud, which afterwards branched out into that extensive and never-fading tree of system produced by the son. The earliest days of Linnæus are said to have been marked by an extraordinary passion for the possession and examination of flowers, of which his father's garden, according to Linnæus's own account in a letter to Baron Haller,

contained more than 400 species, many of them rare and of foreign growth.

It was the natural wish of his parents that their son should be brought up to the ministry; for which purpose he was, till the age of ten years, instructed by his father in the necessary elementary books, and in the rudiments of the latin language. During this period his favorite occupation was eagerly pursued, and his regard for it strengthened by encouragement from his father, who in his eighth year allotted him a separate piece of ground, which was denominated Charle's garden. Into this spot he collected not only such plants as were around him, but whatever native species he could procure by his excursions in the neighbourhood; forming at this early period of his life a real botanical garden in miniature.

At the age of ten years he was sent to the latin school in the town of Wexicoc. The rector of this school, Lanærius, was himself a lover of botany, and probably relaxed somewhat of the rigour of discipline towards a pupil whose extraordinary passion for a favourite study of his own he must have regarded with complacency, and which he must at least have considered as innocent. In this place he remained seven years, and was then removed to the upper college at Wexicoc. Here it was soon perceived that his pursuits had been all absorbed in his eagerness after flowers and insects, and that the studies necessary to qualify him for a clerical avocation had been irremediably neglected: and after

many useless admonitions, and some hints to his parents that a honest trade would be better adapted to the abilities of their son, it was determined that the young Linnæus should be bound apprentice to a shoemaker. The mind however will immediately find relief from the painful degradation it must suffer at the contemplation of this illustrious founder of natural science being about to be sunk into the lowest mass of mechanical drudgery, and repose with grateful benevolence on the memory of Dr. John Rothman, professor of medicine in Wexicœ, to whose discernment and exertions we are solely indebted for his rescue. This good and learned man, who had formed an acquaintance with him and justly appreciated his uncommon abilities and eagerness for natural history, having intelligence of the design of removing him from college, persuaded his friends to let him pursue the tendency of his genius and the wishes of his heart; and that it might not incumber the small income of his father, promised to take him into his own house, gratuitously to furnish him with all necessaries, and himself to teach him the elements of his profession.

With Dr. Rothman he continued three years, enlarging his collections, and accumulating those stores of information which were to conduct him to his future profession. In the library of his patron he fortunately found the *Institutiones Rei Herbariæ*, or *Elements of Botany*, by Tournefort. This gave him the first view of the conveniencies of arrangement and the beauty of



system, and was doubtless the foundation-stone of that adamantine structure which himself afterwards erected.

In the year 1727, at the age of twenty, he went to the university of Lund in the province of Schonen, under the auspices of his relation Professor Humærus; but all his hopes of support and patronage vanished upon his arrival there, for he found that his intended protector was lately dead. He however found means to attend the lectures of Stobæus the professor of botany and medicine, and by his extraordinary diligence and great judgement so interested the professor in his favour, that he compassionated his forlorn condition and received him into his house. Here he had leisure and opportunity to gratify in its fullest extent his ardour for science, and here for the first time he saw a well chosen library of works on botany and a good collection of natural history, and began to collect and arrange a herbal himself. All the powers of his mind and body seem now to have been concentrated in this delightful study. The leisure moments he had in the day time were employed in wandering round the country, exploring and collecting whatever natural objects occurred to him, carefully examining and comparing them with the descriptions of Tournefort, and sometimes writing observations of his own, and assorting them according to system of the master he studied. In one of these excursions he had nearly fallen a victim to the keenness of his curiosity. The *Furia infernalis*, a small slender worm not uncommon in the

marshes of Sweden; had buried itself in his flesh, and produced so violently painful an inflammation, that his life was for some time despaired of. He was however saved by the skill of Stobæus.

At the hour of retirement to rest he secretly took with him from the library of his patron such books as might gratify his appetite for his favourite study; and these he read as long as the portion of light allowed him lasted. Stobæus by some means or other became acquainted with the irregularity of his midnight hours, and from the natural vivacity of his disposition suspecting the innocency of his employments, entered one night abruptly into his apartment; and to his surprise found him surrounded with and attentively reading the works of the best writers on botany. After this time he was allowed the unrestrained use of the library.

With his generous friend Stobæus he remained something more than a year: but desirous of enlarging his knowledge by the possession of more certainties, he removed to Upsal. The professors at that time to which he attached himself, were the junior Olaus <sup>Celsus</sup> Rudbeck, and Roberg. Under the guidance of these learned men Linnæus made rapid advances in the different branches of medicine and natural history, and regardless of what might happen to-morrow, revelled in all the gratifications of intellectual luxury. In course of time however, the slender means with which he had been enabled

to supply himself began to diminish, and in less than a year his wants became so oppressive, that he was constrained to subsist on whatever precarious support accident or the kindness of his fellow students afforded him. So wretchedly abject were his circumstances at one time, that he covered himself with the cast-off clothes of his more wealthy companions, and himself mended the old shoes which were given him with the bark of trees. Yet in this penury and distress the vigour of his mind was never depressed, nor his piety lessened. In his public oration on entering the office of professor, he offers humble thanks to his Maker, that in all his difficulties and under the severest pressure of poverty, the influence of divine providence had guarded and supported him.

At this time Olaus Celsius, principal professor in divinity, and whom Linnæus afterwards describes in a letter to Baron Haller as the only true botanist in Sweden, returned from Stockholm to Upsal. Accidentally finding Linnæus in the botanical garden, he was struck with the uncommon learning and accuracy of his observations, heard of his distresses and inoffensive mode of life, and received him into his house. The advantages of this connection were mutual. Linnæus was removed from poverty and want, kindly cherished by his protector, had the use of one of the most valuable libraries in Sweden, and opportunities of conversing with the most learned men: Celsius was then preparing his *Hiero-*

botanicon, and received such assistance from the critical knowledge of his friend as probably could not elsewhere have been procured.

In his eager search after botanical literature, he accidentally found Vaillant's dissertation on the structure of flowers, where some mention is made of the stamina and pistils, which had before been considered as insignificantly useless, and where something is said of a better theory. This, co-operating probably with his own observations, kindled the first spark of that luminous system which has since diffused its influence wherever the light of literature has found its way. He composed therefore a small treatise on the sexes of plants, full of erudition and novelty, and which speedily conducted him to those honours and regards which his perseverance and attainments so justly merited.

The doctrine that plants had distinct sexes was by no means a new one: but it remained for Linnæus clearly to elucidate this obscure and intricate subject, to demonstrate its universality, and to make it subservient to system. Theophrastus and Aristotle observe that plants are commonly divided into male and female, one of which is fertile the other barren. "If the dust of the branch of a male palm be shaken over the female tree, says Aristotle, the fruit of the latter will ripen quickly." Dioscorides names several plants male and female, but without a knowledge of their relative sexes, for he calls

that the male mercury which bears the seed, and that the female which is barren. Pliny observes that naturalists allow the distinction of sex, not only in trees but in herbs and all plants. Cæsalpinus reformed the errors of former writers, in supposing the barren plant to be the male, and that which bears the seed to be the female: but his notion goes no further than to those where the organs are placed on separate roots produced from the same seed. Zaluzianski, a native of Poland, first discriminated the true sexes of plants, and pointed out the essential difference between the male, the female, and the hermaphrodite. Dr. Grew, in 1682, suggested the idea that the antheræ were necessary to the impregnation of a plant, and plainly delivers it as his opinion, that these burst open and shed the pollen or dust contained in them, which falling on the seed-vessel renders them prolific. These principles were afterwards adopted by Ray, Camerarius who speaks of the number of the stamina in flowers, Malpighi who examined the antheræ and pollen by the microscope, Geoffroy, Jussieu, Vaillant, Morland and others.

Professor Rudbeck, then in his seventieth year, struck with the novelty of the observations contained in this small essay, not only took him into his house, but after a short time suffered him to give lectures for him whenever he was prevented by fatigue or other avocations. Under patronage so dignified and with distinction so flattering, the mind of the young academician began

to soar above the common termination of academical studies, and to be lifted into the regions of fancy and invention. At this time he composed the first rudiment of his immortal system, under the title of *Nuptiæ plantarum*; and his *Hortus Uplandicus*, or enumeration of plants in the several Swedish gardens, for the use of the pupils. He had likewise during his stay at Upsal formed a friendship with Artedi, afterwards so celebrated for his skill in ichthyology; a friendship which similarity of fortunes and pursuits had fastened with its firmest bonds.

In the year 1731, the royal academy of sciences at Upsal determined to send a person, properly qualified, to examine the natural productions of the wild and extensive regions of Lapland. This had already been done under the auspices of Charles XI. by the elder Olaus Celsius: but the whole of his collections and manuscripts, together with his intended *Campi Elisii*, except two folio volumes which were afterwards published by Dr. Smith under the denomination of *Reliquiæ Rudbeckianæ*, were destroyed by the great fire at Upsal in the year 1702. This appointment was given to Linnæus, at the recommendation of Professors Celsius and Rudbeck.

Upon the return of the following spring, after having visited his parents and his old benefactor Stobæus, Linnæus prepared to adventure upon this dangerous and unknown journey: and in the beginning of May, fur-

nished with Swedish money amounting to something less than eight pounds, he left Upsal, and proceeded on horseback as far as Hernösand, the principal town of Angermania on the Bothnian gulph. There he remained a few days anxiously waiting the return of milder weather, and visited at some risk of his life the singular caverns on the top of mount Skula. From this place he travelled on foot; and reaching Amea he left the public road, and took his rout through the vast woods which lie on the west in order to traverse the more southern parts of Lapland. Alone, unacquainted with the language or the manners of the people among whom he was about to commit himself, undaunted by the dangers and difficulties around him, and disdaining the horrors which the imaginations of his friends had magnified before him, he launched into those wild and dreary regions, trusting to providence for his safety and the hospitality of the inhabitants for his support.

Having reached the pine mountains which border on Norway, and after encountering many hardships and privations in a country barren, mountainous and stony, he returned to the western part of Bothnia, and visited Pithea and Lula on the great gulph. Here he proceeded to visit the ruins of the temple of Jockmock in Lapmark, and thence traversed the Lapland desert, destitute of villages, cultivation, roads or any conveniencies, and peopled only by the inhabitants of a few stragling huts. In this district, when under the seventieth degree of

polar longitude, he saw the sun eight whole days without setting. Thence he crossed the Lapland alps into Finmark, and wandered along the shores of the north sea as far as Sallero. In the latter of these excursions he was accompanied by two laplanders, who served him as interpreters and guides. The greater part of the summer was consumed in the examination of these arctic regions, and in September he returned to Tornea with the resolution to visit the eastern side of the Bothnian gulph. After travelling southward through the different towns on the lake, he reached the small university of Abo, and crossing by the island of Aland he arrived at Upsal, emaciated with hardships and fatigue, about the latter end of October. In this journey of six months he travelled over a space more than equal to 800 German leagues, and must have suffered all the vicissitudes of extreme heat and cold, and often hunger and thirst.

Of the events which occurred to him and the various remarks he made, and of the several natural productions which he found in his travels, he kept a regular diary. This inestimable treasure has not been published, but together with many other of his manuscripts is in the possession of the learned President of the Linnéan Society.

Soon after his return the first part of his *Florula Lapponica* was printed in the Swedish literary transactions, and in about two years afterwards in the same



work appeared the second part. This was the first publication of Linnæus, and in this for the first time appeared the science of botany in its sexual dress. And upon this unequivocal testimony of the success of his mission, he was elected a member of the Royal Academy of Sciences.

Encouraged by the academical honours bestowed upon him, and desirous of supporting himself by the honest exertions of his acquirements, in 1733 he gave lectures on botany, mineralogy and chemistry. His superior knowledge in the two latter of these sciences, and the beautiful simplicity of his new system in the former, soon procured him a numerous and attentive audience. But while he was thus beginning to gather the fruits of his industry and labour, and foreseeing probably the diffusion of that system upon the success of which all his hopes of preferment and wealth depended, an unfortunate circumstance occurred, which with whatever regret I relate it must yet be told faithfully.

Dr. Nicholas Rosen had succeeded Rudbeck in the professorship of medicine and anatomy ; and conceiving probably that the genius and reputation of Linnæus stood something in the way of his own fame, or attracted to his new doctrines some of his own pupils, he determined to suppress him. In the statutes of the university it was decreed, that no one should give public lectures till he had attained the degree of Doctor. This qualification

Linnæus wanted. Rosen therefore summoned him before the senate, pleaded the statute and the legal incapacity of his opponent, and he was consequently and necessarily forbidden to continue his lectures. Adversity had not yet so far subdued the noble spirit of Linnæus, as to make him patient of the restraints necessary in the regulation of social life. Upon Rosen's leaving the senate he followed him home, in a paroxysm of rage and despair drew his sword, and but for the interference of some by-standers who wrested the weapon from his hands, would have plunged it into his body. An outrage so contrary to all order and decency made Rosen complain to the senate; and after an investigation, he was, by the kind interposition of Celsius, dismissed with only a reprimand. Perceiving that by this interruption of his plans all his hopes of honours and independence were likely to be frustrated, his determination to revenge himself on this officious opponent was for a time so furious, that he resolved to stab Rosen wherever he should find him in the streets. But the mind of Linnæus could not long hold a resolution so offensive to every rule of reason and religion, and after the vehemence of his passion had somewhat subsided, his reflections upon the hazards he had escaped induced him to write the particular diary which he called *Nemesis divina*.

Deprived of resources which promised so ample a reward for his studies and labours, Linnæus was again

reduced to indigence. And in the year 1733, he made excursions in the mountains round Upsal, accompanied by some of his former pupils, for the purpose of investigating and arranging the minerals of his native country. In Dalecarlia, so celebrated for its copper mines, he became known to Baron Reuterholm, governor of the province, who justly appreciating the great skill and acuteness of observation of his young friend, sent him to the eastern parts of Dalecarlia, and thence to Norway, to explore and report the mines of that district. In this journey he was accompanied by the Baron's two sons, and some other students, who were desirous of acquiring a knowledge of this branch of science. Some observations on the pasture herbs of this district were afterwards published in the second part of the *Amœnitates Academicæ*, under the title of *Pan Succus*.

On his return from this journey he remained at Fahlun, and gave lectures on mineralogy and the art of assaying metals. And during his residence, which he describes as being about a month, he became acquainted with *Moræus* the learned physician of that district. *Moræus* was reputed rich, and had two daughters. With the eldest of these, Sarah Elizabeth, he contracted an intimacy, and whom in about five years afterwards he married. The father however, wisely perceiving the unfinished state of the lover's education, and his inability to profit by the profession he had chosen for want of a

degree, declared that his daughter should remain unmarried three years longer, at the termination of which, he would make his decision as to the match.

It was at that time the habit of the Swedish students in medicine, to graduate in one of the universities of Holland. Collecting therefore what little money he could procure, and assisted by the amiable young lady to whom he had betrothed himself, he prepared for the expedition, upon the success of which depended all his future hopes of happiness and honours.

In the spring of 1735, he began his tour, travelling through the southern parts of Sweden, and across Denmark to Hamburg in Germany. In this city he remained some time, enriching his stores of knowledge by a careful examination of whatever was rare and curious in its libraries or collections, and in becoming known to the most learned of its professors. And here he gave an unlucky example of that critical acuteness in the investigation of the works of nature, by which all his future writings were so highly illuminated.

Spreckelsen, a secretary of the council and a considerable naturalist, had in his possession a monstrous production, which till that time had been considered the most valuable curiosity in Europe, and was received as a pledge for the loan of ten thousand marks, a sum equal to seven

hundred and fifty pounds. It represented a serpent with seven heads, and had been figured as such by Seba in his *Thefaurus Nataralium*.

This celebrated monster, upon an accurate examination, and by his acquaintance with the comparative structure of the jaw-bones of animals, Linnæus found to be an imposture; and proved that these seven heads were merely made up of the jaw bones of Weasels artfully covered with the skins of serpents. A discovery so injurious to its possessor and the credit of the university, raised a clamour against the young naturalist, the fury of which he thought it prudent to avoid, through the advice of his friend Dr. Jænisch, by silently leaving the city.

Prosecuting the object of his journey, he reached the University of Harderwyk in the end of May, and on the twenty-fourth of the following June was admitted Doctor in Medicine. His inaugural thesis was a dissertation on the causes of intermittent fevers, which in 1735 was published in the *Amœnitates Academicæ*. From Harderwyk he proceeded to Leyden and formed an intimacy with Van Royen, who afterwards succeeded Boerhave, Van Sweiten, Leiburkhun, Lawson, and Gro-novius. Among the causes which contributed to enlarge the views and ripen the judgement of Linnæus, may be reckoned the facility with which he made himself known and regarded by the most learned men of his time. Wherever he came, he found a friend, and that friend

generally of the first reputation in the sciences he studied.

In this year he laid the foundation stone of that splendid temple of nature, in which he afterwards saw the most enlightened men on the globe officiating as her priests, by publishing the first edition of his *Systema Naturæ*, in fourteen folio pages. This small prospectus excited universal attention, and having sent a copy to the great Boerhave, with whom he had long but unsuccessfully been desirous of conversing, he was invited to meet him at his villa near Leyden. The effect of this meeting was so satisfactory on each side, that Boerhave on his departure furnished Linnæus with a friendly letter to professor Burmann of Amsterdam. Burmann was at that time writing his *Flora Zeylanica*, and immediately perceiving the great knowledge and accuracy of Linnæus, took him into his house.

At this time Dr. George Clifford, a Burgomaster of Amsterdam and a director of the Dutch East-India Company, had formed a museum and a botanic garden at his seat at Hartecamp near Harleim. His fortune was princely, and he had expended large sums in procuring from all quarters of the globe whatever was curious and valuable in botany and natural history. This costly collection was deposited at Hartecamp, without arrangement or scientific description. Boerhave, who was his physician, advised him to keep a medical man in his

house, and recollecting the young Swede with whose attainments he had lately been so well satisfied, recommended Linnæus as being the most likely to give order and description to his collections. The display of natural knowledge which Linnæus produced at their first interview, so well accorded with the wishes of Cliffort, that he instantly offered him a situation in his family, and a ducat a day for his stipend.

An establishment at once so liberal and comparatively splendid, diverted Linnæus from his intentions of returning to Sweden. In the house of his patron he found collected whatever could gratify his desire of information in his favourite studies, and reposed with perfect ease with respect to pecuniary circumstances. In the year 1736 he published his *Fundamenta Botanica* which afterwards appeared in an enlarged form, under the title of *Philosophia Botanica*, his *Bibliotheca Botanica*, and his *Musa Cliffortiana*, or description of the rare plant *Musa paradifica*. In this same year he was admitted a member of the Imperial Academy of Naturalists at Vienna, under the flattering denomination of *Dioscorides the second*.

In the summer of the following year, Cliffort, desirous of enlarging his collection of foreign plants, furnished Linnæus with the means of travelling into England, for the purpose of procuring specimens of the rarer North American plants, at that time cultivated at

Oxford and the nurseries about London. After a passage of eight days from Rotterdam, he arrived at Harwich, and proceeded to London. That he might have the less difficulty in fulfilling the object of his mission, Borerhave had given him a letter of recommendation to Sir Hans Sloane. This letter is preserved in the British Museum, and in a manly and dignified style, congratulates these two great men upon their meeting together. "Linnæus who is the bearer of this letter, is alone worthy to see you, alone worthy to be seen by you. He who shall see you both together, shall see two men, whose equal it is probable the world will not now produce." Sir Hans, then in the seventy-eighth year of his age, and unwilling at that time of life to have his botanical creed interrupted by innovations so totally subversive of the system he had cherished, merely gave him permission to examine his cabinet and his herbal. At Chelsea he visited the apothecarie's botanic garden, from which Clifort wished him to procure some foreign plants. Phillip Miller was then curator of the garden, and gave the plants he pointed out their old names. The propriety of these appellations Linnæus disputed; and after some short intercourse, they parted with mutual assurances of regard, entered into a friendly correspondence with each other, and the garden at Chelsea had afterwards the honour of being the first in great Britain that was arranged according to the Linnean system. Arriving at Oxford he found Dillenius in company with William Sherrard. Sherrard was to Dillenius what Clifort was to



Linnæus, a patron and protector : he founded the botanic garden at Oxford, of which Dillenius was the first professor. This interview was by no means creditable to the professor, or flattering to the young stranger. Dillenius, perceiving he did not understand the English language, described him to Sherrard as the young man who confounded all botany. The words confound and botany being of Roman origin, Linnæus understood the purport of his observation; and after some ineffectual attempts to conciliate the kindness of the professor, before his departure, boldly asked why he had pointed him out as the confounder of all botany. To justify his assertion, the professor produced from his library a part of the *Genera Plantarum*, which was then printing at Leyden, and which Gronovius had sent to Oxford without the knowledge of its author. In this work he had marked all which he conceived to be the false genera. To refute this opinion Linnæus challenged him to an immediate demonstration, and convinced him that all his genera were accurate, and that what appeared to be wrong was merely the correction of ancient and continued error. This somewhat softened the reserve and austerity of the professor, and he invited him to the inspection of his own and the Sherrardian collection, and gave him what plants he wanted for Clifforts' garden. They afterwards corresponded, but with no great warmth of friendship on the professor's side. Too old to study and embrace a new system, and too haughty to acknowledge the merits of his rival in fame, he would never publicly

adopt the Linnæan arrangement. Upon his return to Holland, Linnæus, always ambitious of adding to the number of his friends the first names among the favourers of natural science, endeavoured to obtain the countenance of Dillenius, by dedicating to him his *Critica Botanica*: but in some of his letters to Haller, Dillenius treats him with a moroseness of criticism and a harshness of language, which the known learning and endowments of Linnæus did not deserve, and which it became not one of the most learned men in a learned university to apply. During his stay in England, Linnæus had secured the correspondence of Miller, Martyn, Collinson, Rand, and Ehret.

Fully gratified by the events and success of his journey, he returned to Holland about the end of the summer, and employed himself in the arrangement of Clifford's garden, and in digesting the fruits of his own observations. In this year he published his *Critica Botanica*, *Hortus Cliffortianus*, *Flora Lapponica*, *Genera Plantarum*, and a supplement called *Corollarium Generum*, forming together a mass of original knowledge, such, as perhaps, no man ever produced in science within the same period of time.

At this time the office of Physician in ordinary to the Dutch establishment in Surinam became vacant. The appointment was vested in Boerhave, who offered it to Linnæus. This he declined, but recommended

Dr. Bartsch, a young man with whom he had formed a friendship at Leyden. They had both warmed themselves with promises of reciprocal kindnesses, and Linnæus had hoped by the means of his friend to be occasionally supplied with the rarities of Guinea; but Bartsch did not survive his appointment more than six months.

Occasionally attending Clifford to Amsterdam, he went to Leyden and visited his friend Van Royen, who wished him to stay and assist him in the arrangement of the botanical garden there, and offered him a salary of 800 florins a year. Here he remained the whole of the winter, and during his stay published the *Ichthyology* of his deceased friend Artedi, and his own *Classes Plantarum*.

Early in the spring of 1738, he was afflicted with a long and dangerous illness, occasioned as it is supposed by the treachery of a friend. This faithless wretch had been entrusted with the care of the correspondence between Linnæus and his intended bride, Miss Moræus; and betraying the confidence reposed in him, endeavoured to procure the lady for himself, by persuading her father of the improbability of Linnæus ever returning to Sweden after having exceeded the three years at first appointed for his daughter's celibacy. This misfortune was however prevented by the interposition of another friend; and upon his recovery, Linnæus determined to

hasten homewards. In his way he visited France, became known to the two brothers Jussieu, and examined their herbals, together with those of Tournefort, Vaillant and Surian, and visited the several gardens and museums in and round Paris. After a residence of about a month in this metropolis, and after having been admitted a corresponding member of the Academy of Sciences, he got a passage on board a ship from Rouen to Helsingburg in Scania, and reached Stockholm in September, 1738.

His intention now was to settle himself at Stockholm in the practice of his profession. But whatever honours his great skill in botany might have procured him abroad, he did not in his own country immediately find that they led to wealth and independence. Teased with opposition to his new system, and the profits of his profession being as yet but slender, his circumstances were not such as could justify him in gratifying the wishes of his heart, by marrying the lady to whom he had been so long betrothed. But from this cloud of obscurity he in a short time burst forth. Haller, with whom he had long corresponded, offered to resign to him his own professorship of botany at Göttingen. This offer Linnæus would doubtless have accepted, but perceiving his practice growing daily more lucrative, and unwilling totally to abandon his native country, he ultimately declined it. His difficulties began now to vanish gradually, and his fame to extend itself; and having by a lucky prescription relieved the Queen from a troublesome cough, he became

known at the court. Count Tessin, at that time possessed of great influence, gave him his patronage, and in a short time procured him the office of Physician to the fleet and botanist to the king. In possession to these honourable offices, together with a lucrative profession, on the 26th of June he married Miss Moræus.

In the latter end of the same year, by the interest of Tessin, he laid the foundation of the Royal Academy of Sciences at Stockholm, of which he was appointed the first president. The duration of this office was by the statutes of the institution determinable at the end of three months, and upon his resignation he made an oration on the singularities in the habits and manners of insects.

Tessin seems to have been his great Mæcenæ, to have sought him in his obscurity, and to have conducted him to the highest regards and honours. He procured him a pension from the treasury, made him president of the college of physicians, introduced him to two kings, caused him to be ennobled, and recommended him to posterity by a medal. To this noble patron Linnæus dedicated the twelfth edition of his *Systema Naturæ*, and in a grateful strain of the most affecting eloquence, he thus pours out his acknowledgments.

Cum quivis auctor speret se apud posteros gratiam  
Habere, et possit secum duratura nomina educere,  
Auctori meæ fortunæ libellum ultimo nunc offero.  
Ille me, peregrinum in patria, reducem excepit;

B 3 2

x Oration de reconnaissance au Roi de Suède, &c.

Ille mihi stipendium ab ordinibus regni expetiit;

Ille mihi spartam medici classis procuravit;

Ille mihi munus quo fungor conciliavit;

Ille mihi titulum quo distinguor paravit;

Ille me ad serenissimos reges introduxit;

Ille me cuso numismate posteritati commendavit.

“ Ille meas errare loves, ut cernis, et ipsum

“ Ludere quæ vellem calamo permisit agresti;

quare

“ Cana prius gelido defint absinthia ponto,

“ Quam nostro illius labatur pectore vultus.

At Stockholm he remained three years, following his profession with much dignity and honour, and ripening those stores of knowledge, which had already bloomed and spread their fragrance through the greater part of Europe. Opposition began silently and gradually to withdraw its fangs, and the rays of never-fading fame to glitter round his name. During this period he appears to have merely written some treatises in the Swedish Transactions and the Amœnitates Academicæ,

On the twentieth of January, 1741, his only son, the younger Linnæus was born; and about that time, under the directions of the states, he was appointed to travel into the islands of Oeland and Gothland, with a view to search into the various natural productions applicable to the manufactures of the kingdom. In this tour he was accompanied by six of his pupils. The chief object of his journey was to look after an earth fit for the fabrication of porcellane ware, and to note such plants as might be useful in medicine or any of the domestic arts.

This earth he was not fortunate enough to find, but he afterwards published an account of the productions, and of the manners of the inhabitants of these islands.

At this time the professorship of physic and anatomy in the university of Upsal became vacant by the resignation of Robery. For this situation Linnæus became a candidate, and through the interest of Tessin succeeded. At his installation he delivered an oration<sup>x</sup> on the necessity of excursions in ones own country, for the purpose of searching into the objects it may hold out fit for cultivation, in geography, mineralogy, botany, zoology, and the several economic arts. This essay is among the most pleasing and instructive of all his productions.

His old antagonist Rosen had, some little time before, been elected professor of botany in the same university. The cause of their animosity had long since ceased, and they met together in perfect amity. Finding that the situation which each of these respectively held, was more adapted to the inclination and pursuits of the other, by the desire of both with the consent of the university they were mutually exchanged; and Linnæus at last obtained what had long been the object of his wishes, the professorship of botany in Upsal.

Since the fire in 1702, which had laid the greater part of the city in ruins, the academical house and garden had been in such a state of decay, that upon his

*x De peregrinationem intra Sueciam n. c. 1744.  
tulis Oct. 17. 1744.*

taking possession, there were hardly fifty exotic plants to be found in it. By the bounty of his sovereign, however, and by the correspondence he had established with the most learned naturalists in Europe, the buildings were repaired, the garden replenished with the rarest and most valuable exotics, and at last it equalled in celebrity any repository of this nature which the world could produce. Six years afterwards, he published a description of it, containing an enumeration of the foreign plants he had procured and enriched it with, amounting to eleven hundred. His lecture-room now became crowded with students from almost every country of Europe, and it is said that at one time he numbered fifteen hundred. These he occasionally took in clusters into the different districts of the country for the purpose of making collections, and when he at any time found what he thought worthy of demonstration, his pupils gathered round him at the sound of a horn or trumpet.

His lectures comprised, besides botany and natural history, the medicinal uses of plants, the *Materia Medica*, and the knowledge of diseases. The conflux of students which these brought into the university, and the fame of his system of nature, a sixth edition of which was published at Stockholm, in 1748, had now exhibited him to the government of his country as its greatest ornament and benefactor. Presents of whatever was rare and valuable in every department of nature, from all parts of the globe, poured in upon him. The King and Queen



of Sweden had their separate museums, the one at Abricksdahl, and the other at Drottningholm: the arranging and describing of both these was committed to his care. The museum of the Royal Academy at Upsal had likewise been augmented by a rich donation from the king, whilst he was hereditary prince, in 1746: by another from Count Gollenberg in 1745: and by a third from Mr. Grill, an opulent citizen at Stockholm; and by the Chinese curiosities of Lagerstrœm at Gottenburg.

Within the space of ten years, from 1740 to 1750, he published his *Flora Suecica*, *Fauna Suecica*, *Flora Zeylanica*, and *Hortus Upsalensis* and *Materia Medica*, besides twenty-five original treatises in the separate annals of his country.

From almost all the learned societies in Europe he received academical honours, and four of the nobles of his own country gave a high and honourable tribute to his merits, by causing a gold medal to be struck in his remembrance. On one side of the medal was the crest of Linnæus, with this inscription;

CAROL. LINNÆUS, M. D. Bot. Prof. Ups. Ætat. xxxix.

On the other side were these words;

CAROLO GUSTAVO TESSIN ET IMORTALITATI  
EFFIGIEM CAROLI LINNÆI EL. EKEBLAD, ANDR.  
HOEPKEN, N. PALMSTIERNA, ET CAR. HARLEMAN.  
DIC. MDCCXLVI.

It was in consequence of this dedication to his great patron, that Tessimaels in the year following, caused a silver medal to be struck, with the crest of Linnæus on one side, and on the other three crowns, on which the sun sheds his beams, with the simple motto, *illustrat.* His own sovereign likewise, king Adolphus Frederic, awake to his extraordinary merits, bestowed upon him frequent marks of his royal distinction.

In the year 1750, he had some severe attacks of the gout: and himself relates, that accidentally refreshing himself with some straw-berries, he felt himself relieved, and afterwards, whenever the fit recurred had recourse to them, and eventually expelled it from his frame.

In 1751, he published his *Philosophia Botanica*, which Rousseau mentions as the most philosophical book he had ever seen; in 1753, appeared the first edition of his immortal work the *Species Plantarum*, which he dedicated to the King and Queen of Sweden, and in which he describes 7,300 species of plants; and in the same year he published the *Museum Tessinianum*, or account of the natural rarities in Count Tessin's museum: in the year following appeared his *Museum Regis Adolphi*, and in ten years afterwards the *Musæum Reginae Louisæ Ulricæ*. The *Amœnitates Academicæ* were begun in 1749, and continued to 1769, making seven volumes, and containing one hundred and fifty dissertations, all on the history and economy of nature; they were

afterwards published by Schreber, in ten volumes, augmented by the later dissertations of Linnæus and some writings of his son. In 1760 appeared his *Disquisitio de sexibus plantarum*, and he obtained the premium proposed by the Imperial Academy of Sciences, for the best paper written to establish or disprove, by new argument, the doctrine of the sexes of plants: and in the same year were published his *Genera Morborum* and *Clavis Medicina*.

In his minute researches into the physiology and manners of the smaller animals, he had frequent opportunities of correcting the numberless errors of ancient authors, and to make some singular discoveries himself. He first observed that the tania or tape-worm was composed of an aggregate number of distinct animals joined together, and that each of its divisions contains all the parts proper for life and the continuation of its kind. He likewise became acquainted with the manner in which pearls are generated in their shells, and was able to produce them artificially. For the communication of this secret, the states of Sweden gave him a large reward.

His fame had now extended itself to every part of the lettered world; and to send a seed, a plant, or a rare animal to Linnæus, was considered as reflecting honour on the donor. Nations began to consider him

as glorious to the country in which he lived, and crowned heads desired to possess him. The king of Spain offered him an annual pension of two thousand piasters, equal to three hundred and fifty pounds, the free exercise of his religion, and a patent of nobility, if he would reside at Madrid. Offers were likewise made him from the courts of Petersburg and Great Britain. But Linnæus chose rather to enrich with the splendor of his reputation, the country which produced him, and the friends who nourished him.

Frederick the first who like his successor gave much encouragement to literature, had in the year 1748, founded in Sweden the order of the Polar Star. Into this order Linnæus was admitted by Frederick Adolphus, and in 1753, on the twenty-seventh of April, he was created a knight of the Polar Star. And as a further reward for his merits and the distinction to which he had raised the university of Upsal, he was by the same royal munificence, by a diploma, dated the fourth of April, 1757, admitted among the hereditary nobility of his country. At this time he changed his name to Von Linné; the termination *us* being confined to the plebeians of Sweden.

In 1755, he obtained the first prize which Count Sparre had left, to be given for the best treatise on the subject of agriculture and the several branches of rural economy. It consisted of two gold medals, of the value

of twenty ducats. His paper was on the indigenous alpine plants of Sweden, and their uses ; and was inserted in the Stockholm Transactions. He had likewise, in 1759, adjudged to him the prize of a hundred ducats, offered by the Imperial Academy of Sciences at Petersburg, for the best paper written to establish or refute, by new arguments, the doctrine of the sexes of plants. This distinction, by which his system was established in a foreign university, must have been the more flattering to Linné, as Siegesbeck, a professor in that academy, had with more than common zeal and warmth, endeavoured to prove this doctrine has no foundation in nature. His *Genera Morborum*, and *Clavis Medica*, were both published in 1763.

Before his death he was elected a member of twenty academies, including the three of his own country. In 1759 he became member of the academy at Florence, in 1762, he was admitted to the Royal Academy of Sciences at Paris, and to the British Ecnomical Society ; in 1766 to that of Droutheim, and in 1767 to that of Cell ; in 1770 he was elected to the Academy of Philadelphia ; in 1771 to that of Rotterdam and Sienna ; in 1772 to that of Bern, in 1775 he became a Fellow of the Royal Patriotic Society in Sweden ; and a little time before his death he was admitted to the Medical Society of Paris.

By the profits of a very lucrative profession, by the

fortune which his wife brought him, and the sale of his works, together with numerous rich presents he occasionally received, Linné became at last a very wealthy man. His salary was double during the latter part of <sup>when</sup> his life, by Gustavus the third, who likewise settled on his family a liberal estate of landed property. He purchased the villa of Hammerby, a small distance from Upsal, which for the last fifteen years of his life he made his summer residence, and where he kept his collections of natural history.

The last public exertion of Linné, was a beautiful oration delivered before the university, when he resigned his office of Rector. This was in the latter end of the year 1772, in the sixty-fifth year of his age.

Disease and the imbecilities of age, began now to make hasty devastation on his constitution. During the later years of his life, he was occasionally tormented by excruciating fits of the stone, and nervous head ach; twice he was seized with apoplexy, which rendered him partially paralytic, and much impaired his memory. At last he became a wretched and melancholy ruin in intellect as well as bodily powers, and on the tenth of January 1778, in a gentle slumber, this great man sunk into the grave. *in the 71<sup>st</sup> year of his age.*

The death of Linné was regarded in Sweden as a national calamity. The whole university went into

*and the whole of the body.*

mourning ; his funeral was attended by all the professors, doctors, and students then at Upsal ; and his pall was supported by eighteen doctors, who had formerly been his pupils. The Academy of Belles Letters at Stockholm offered a gold medal for the best eulogium on Linné, and another was offered, by the command of the King, for the best inscription, either in Latin or Swedish, to be engraved on his monument, erected at the entrance of the new botanical garden. The king, in his speech to the states, publicly lamented his death ; and ordered a medal to be struck to his memory. And in 1787, when the foundation of the new building in the botanical garden was laid, among the Swedish coins which were deposited on the first stone, a medal was likewise placed in honor of Linné.

In other places likewise, where his merits were revered, honors in token of regard and affection for his memory were exhibited. Dr. Hope, the professor of botany at Edinburg, pronounced an oration in praise of Linné, at the opening of his lectures in 1778 ; and erected a monument to him in the botanic garden of that university. Condorcet and Vice d'Azyr read panegyrics in his praise at Paris, and the same was done by Beiris at Helmstadt. The Duke de Noailles caused a monument to be erected to his memory in his garden.

The issue of Linné were two sons and four daughters : Charles, who succeeded his father : John, who

died in his infancy : Elizabeth Christiana, who married Bergencrantz, a captain of cavalry ; she has been some years dead, and left one daughter : Louisa, and Sarah Christiana, both at present resident with their mother at Hammarby : and Sophia, who is married to Duse, procurator of the senate of the university of Upsal.

His son Charles succeeded Linné in the office of Professor of Botany at Upsal. He had, as may be readily conjectured, been early encouraged in the studies of natural science ; but by an unaccountable hatred with which his mother pursued him, his home became unpleasant, and his pursuits disgustful : after his father's death, however, his zeal for the promotion of natural science returned ; he purchased from her his father's manuscripts and collections : and in 1781, with the assistance of Ehrhart, published at Brunswick the *Supplementum Plantarum*. In the spring of the same year, he visited London, and was received by Sir Joseph Banks and the most eminent naturalists of Great Britain, with a warmth of regard and attention, which at once did honour to their liberality and the memory of his father. From England he travelled into France, where, among the many testimonies of esteem he received from the first characters in science, he was presented by Louis XVI. with a copy of the splendid collection of plants engraved by his majesty's command. From Paris he proceeded to Holland, and returned to Stockholm through Westphalia and Lower Saxony, after an absence of about two years.



Here, while he was forming plans for his future fame and the advancement of science, he was seized with a bilious fever; and after several relapses, he died on the first of November 1783, in the forty-second year of his age.

By the death of the younger Linnæus, the male branch of the family became extinct: and his possessions devolved to his mother and sisters. These ladies, willing to dispose of what to them was a mere splendid incumbrance, by the advice of their friends, offered the museum and the whole of the collections and correspondence to Sir Joseph Banks, as the most liberal and wealthy naturalist in Europe, for the sum of a thousand guineas. Sir Joseph himself declined the purchase, but recommended it to the consideration of his friend Doctor J. E. Smith. After some negotiation the bargain was made, which seems to have been conducted on all sides with much honour and integrity, and these inestimable treasures were sent to England in twenty-six large packages. They contained the whole of the collections of both father and son; the library, consisting of about 2,500 volumes; and the manuscripts and correspondence.

During this transaction the king of Sweden was absent from his dominions: but returning soon after the ship had sailed for England, and unwilling that his country should be deprived of these inestimable treasures, he sent an armed vessel to bring the ship back: but fortu-

nately for the lucky purchaser, the English vessel was not overtaken.

Three societies, since the death of Linné, have been established, for the advancement of natural science, and the diffusion of whatever knowledge in its several branches can be brought together. The first was assembled at Paris, in the year 1787, under the denomination of Société Linnéenne. The next was instituted at London, in 1788, under the direction and presidency of Dr J. E. Smith. This last has already published seven quarto volumes of its transactions, containing a large mass of original and valuable communication in the several departments of natural history : and in 1802, was incorporated by a royal charter, with a patent for armorial bearings. A third was formed at Leipzig, 1790, under the care of Professor Ludwig.

Linné was in stature rather below the common size, and of a tolerably muscular frame. In walking he stooped a little, which might be occasioned by his habit of searching after and collecting plants. His head was very large and prominent behind, with small brown piercing eyes. His temper was quick and hasty, but soon and easily appeased. \* Conscious of the powers he possessed, he preserved a manly and dignified silence in the numerous attacks upon and the great opposition made to his system. In the delivery of his lectures he is said to have been graceful and impressive, and the facility with

which he used the Latin language caused him to speak and write perfectly aphoristically.

Among his various writings it is probable that the best is his *Philosophia Botanica*, a work containing more original matter and genuine science than any book which at present occurs to my memory. Something of the playfulness of his temper may be observed in his *Critica Botanica*, when in his directions concerning the appropriation of celebrated names to the genera of plants, he observes, that a proper connection should be preserved between the habits and appearance of the plant and the name from which it has its derivation : and after some examples he concludes with his own. “ *Linnæam*  
 “ *dixit cæl. Gronovius plantam lapponicam, depressam,*  
 “ *vilem, neglectam, brevi tempore florentem, a confi-*  
 “ *mili suo Linnæo.*”

His system, now received in every country illuminated by the rays of science, may be considered as the bible of nature, the great nomenclature of natural science ; where every genuine character is a family portraiture, and every specific description a miniature ; and where, by a few simple appropriate terms, the image of every distinct object on the globe we inhabit is reflected on the mind and the memory.

For the grossness and vulgarity of language used in depicting the shells, I know not what excuse can be

made : and it is to be lamented, that in every Latin edition, and by every succeeding writer, these highly exceptionable idioms are preserved. While the descriptive language of natural history is polishing down to almost mathematical precision, surely it is desirable that a revision be made of this department, and fitter terms adopted.

To this system may be justly applied the nervous observation of Dr Johnson, in his delineation of the character of Shakespeare. “The stream of time, which is continually washing away the dissoluble fabrics of other systems, passes without injury by the adamant of Linné.”

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<b>A</b>	Page		Page
<b>ACTINOLITE</b>	69	<i>Arseniate of lead</i>	285
<i>Actinotus, Actinote</i>	68	<i>Arseniate of nickel</i>	288
<i>Adamantine earth</i>	175	<i>Arsenical pyrites</i>	300
<i>Adamantine spar</i>	175	<i>Arsenical silver ore</i>	252
<i>Adamantinus</i>	179	<i>Arsenicated antimony</i>	294
<i>Adamas</i>	174	<i>Arsenicated bismuth</i>	293
<i>Æthiops mineral</i>	256	<i>Arsen cum, Arsenic</i>	298
<i>Agaric mineral</i>	76	<i>Asbestoid</i>	68
<i>Alabaster</i>	86, 102	<i>Asbestos, Asbest</i>	66
<i>Almond stone</i>	159	<i>Asphalt</i>	231
<i>Alumen, Alum</i>	220	<i>Astroites</i>	342
<i>Alumina</i>	112, 122	<i>Avanturine</i>	201
<i>Aluminaris</i>	112	<i>Aurum</i>	246
<i>Aluminous earth</i>	222		
<i>Aluminous ore</i>	221	<b>B</b>	
<i>Amalgam</i>	255	<i>Borbadoes tar</i>	230
<i>Amarum</i>	218	<i>Barytes, Baryt</i>	71
<i>Amarus</i>	158	<i>Basaltes, Basalt</i>	126
<i>Amber</i>	235	<i>Basaltine</i>	70, 139
<i>Ambergriſe</i>	236	<i>Basatine</i>	149
<i>Ambra</i>	236	<i>Beil metal</i>	267
<i>Amiant</i>	66	<i>Beryll</i>	144, 145
<i>Ammoniac</i>	213	<i>Bisinitum, Bismuth</i>	202
<i>Amphibiolithus</i>	319	<i>Bittersalt</i>	218
<i>Amygdalytes</i>	195	<i>Bitumen</i>	229
<i>Anatase</i>	312	<i>Bituminous wood</i>	232
<i>Anthropolithus</i>	316	<i>Black blende</i>	291
<i>Antimony</i>	293	<i>Black chalk</i>	125
<i>Apatites, Apatite</i>	109	<i>Black jack</i>	291
<i>Aquamarine</i>	144	<i>Black lead</i>	237
<i>Ardelia</i>	123	<i>Blende</i>	291
<i>Arena</i>	160	<i>Blo d'ione</i>	173, 274
<i>Arenarius</i>	203	<i>Blue vitriol</i>	224
<i>Argentum</i>	249	<i>Boie</i>	116
<i>Argilla, Argil</i>	112	<i>Bologna stone</i>	72
<i>Arseniate of cobalt</i>	303	<i>Bonowen stone</i>	72
<i>Arseniate of copper</i>	264	<i>Boracices, Boracite</i>	111
<i>Arseniate of iron</i>	278		



## INDEX.

iii.

	Page		Page
<i>Flowers of bismuth</i> . . . . .	292	<i>Hyacinth</i> . . . . .	143
<i>Fluate of lime</i> . . . . .	107	<i>Hyacinthine</i> . . . . .	140
<i>Fluor</i> . . . . .	107	<i>Hyalite</i> . . . . .	149
<i>Fluor spar</i> . . . . .	108	<i>Hydrargyrum</i> . . . . .	255
<i>Foliated and sparry limestone</i> . . . . .	81		
<i>Fuller's earth</i> . . . . .	114		
		J	
G		<i>Jade</i> . . . . .	65
<i>Gagat</i> . . . . .	232	<i>Jargon</i> . . . . .	143, 153
<i>Galena</i> . . . . .	289	<i>Jaspis, Jasper</i> . . . . .	155, 156
<i>Garnet</i> . . . . .	147	<i>Ichthyolithus</i> . . . . .	326
<i>Gemma</i> . . . . .	142	<i>Jet</i> . . . . .	232
<i>Glass copper ore</i> . . . . .	260	<i>Jews stone</i> . . . . .	326
<i>Glass of lead</i> . . . . .	282	<i>Inolithus</i> . . . . .	86
<i>Glass of antimony</i> . . . . .	69	<i>Iron</i> . . . . .	268
<i>Glauber's salt</i> . . . . .	216	<i>Iron ochre</i> . . . . .	276
<i>Glist or glimmer</i> . . . . .	130	<i>Iron pyrites</i> . . . . .	278
<i>Gneissum, Gneiff.</i> . . . .	182	<i>Iserine</i> . . . . .	312
<i>Gold</i> . . . . .	246		
<i>Granites, Granite</i> . . . . .	176	K	
<i>Gravel</i> . . . . .	161	<i>Ketton stone</i> . . . . .	89
<i>Graphites</i> . . . . .	237	<i>Killas</i> . . . . .	125
<i>Green carbonate of copper</i> . . . . .	262	<i>Kupfer nickel</i> . . . . .	289
<i>Green cobalt ore</i> . . . . .	303		
<i>Green copper</i> . . . . .	262	L	
<i>Green vitriol</i> . . . . .	225	<i>Labradore stone</i> . . . . .	151
<i>Grey cobalt ore</i> . . . . .	304	<i>Lapis armenus</i> . . . . .	261
<i>Grey copper ore</i> . . . . .	265	<i>Lapis calaminaris</i> . . . . .	290
<i>Grey silver</i> . . . . .	254	<i>Lapis lazuli</i> . . . . .	157
<i>Grindstone</i> . . . . .	203	<i>Larva</i> . . . . .	128
<i>Grit</i> . . . . .	161	<i>Lazalite</i> . . . . .	157
<i>Gypseous earth</i> . . . . .	102	<i>Lazulus</i> . . . . .	156
<i>Gypsum</i> . . . . .	102	<i>Lead</i> . . . . .	281
		<i>Llead glance</i> . . . . .	286
H		<i>Lemnian earth</i> . . . . .	114
<i>Hæmatites</i> . . . . .	274	<i>Lepidolite</i> . . . . .	131
<i>Hair salt</i> . . . . .	221	<i>Leucite</i> . . . . .	139
<i>Heavy spar</i> . . . . .	71, 72	<i>Lilalite</i> . . . . .	131
<i>Heliotrope</i> . . . . .	173	<i>Lime</i> . . . . .	77
<i>Helmintholithus</i> . . . . .	322	<i>Lime-stone</i> . . . . .	93
<i>Hepatic copper ore</i> . . . . .	260	<i>Lithomarg</i> . . . . .	113
<i>Hepatic mercurial ore</i> . . . . .	307	<i>Liver of sulphur</i> . . . . .	239
<i>Hepaticus</i> . . . . .	106	<i>Loadstone</i> . . . . .	270
<i>Honey stone</i> . . . . .	234	<i>Lozland iron ore</i> . . . . .	277
<i>Hornblenda, Hornblend</i> . . . . .	69	<i>Lydius, Lydian stone</i> . . . . .	159
<i>Hornblend slate</i> . . . . .	184		
<i>Hornstone</i> . . . . .	153	M	
<i>Humus</i> . . . . .	96	<i>Magnesiata</i> . . . . .	100
		<i>Magnesia</i> . . . . .	105

## INDEX.

	Page		Page
Magnet . . . . .	270	Muriat of copper . . . . .	264
Magnetic iron ore . . . . .	269	Muriat of lime . . . . .	214
Magnetic sand . . . . .	270	Muriat of magnesia . . . . .	215
Malachite . . . . .	263	Muriat of mercury . . . . .	256
Malacholite . . . . .	69	Muriat of potass . . . . .	213
Maltha . . . . .	230	Muriat of silver . . . . .	250
Manganese . . . . .	305	Muriat of soda . . . . .	212
Marcasite . . . . .	300	Muriat of strontian . . . . .	214
Marga, Marl . . . . .	97	Muriatic acid . . . . .	212
Marly tufa . . . . .	79	Muriatic spar . . . . .	63
Marmor, Marble . . . . .	89	Muscovy tale . . . . .	230
Martial clay . . . . .	119		
Martial vitriol . . . . .	225	N	
Mellelite . . . . .	234	Naphtha . . . . .	221
Mellites, Mellite . . . . .	234	Natrum, Natron . . . . .	210
Menachanite . . . . .	311	Nephrite . . . . .	65
Mercury . . . . .	255	Niccolum, Nickel . . . . .	288
Meteoric iron . . . . .	269	Nigrine . . . . .	312
Mica . . . . .	130	Nitrat of potass . . . . .	215
Mill-stone . . . . .	208	Nitrum, Nitre . . . . .	215
Mineral caboutcbouc . . . . .	231	Nowaculite . . . . .	123
Mineral mummy . . . . .	230		
Mineral pitch . . . . .	230	O	
Mineral tallow . . . . .	231	Olive chrysolite . . . . .	149
Mineral tar . . . . .	230	Olivinus, Olivin . . . . .	149
Mirabile . . . . .	206	Onyx . . . . .	172
Mispickel . . . . .	278, 301	Oolite . . . . .	89
Molybdænum . . . . .	309	Opalus, Opal . . . . .	132
Molybdat of lead . . . . .	203	Ornitholithus . . . . .	318
Molybdænite . . . . .	309	Orpiment . . . . .	299
Moonstone . . . . .	151	Oxyde of arsenic . . . . .	299
Mould . . . . .	96	Oxyde of bismuth . . . . .	292
Mountain blue . . . . .	261	Oxyde of nickel . . . . .	288
Mountain butter . . . . .	221	Oxyde of uranite . . . . .	310
Mountain cork . . . . .	67	Oxyde of zinc . . . . .	290
Mountain flax . . . . .	66	Oxygenized tin . . . . .	281
Mountain green . . . . .	262		
Mountain leather . . . . .	97	P	
Mountain wood . . . . .	67	Peach . . . . .	63
Mullat of alumina . . . . .	234	Pearl spar . . . . .	81, 275
Muller's, glass . . . . .	149	Peat . . . . .	299
Mummy . . . . .	230	Pechblende . . . . .	311
Mundic . . . . .	266	Perigora-stone . . . . .	307
Muria . . . . .	212	Petrifications . . . . .	316
Muriat of alumina . . . . .	213	Petrolite . . . . .	150
Muriat of ammonia . . . . .	213	Petroleum . . . . .	230
Muriat of antimony . . . . .	296	Petrofalex . . . . .	153
Muriat of barytes . . . . .	214	Phosphate of alumina . . . . .	220



## INDEX.

**y**

	Page		Page
<i>Phosphate of copper</i>	264	<i>Sal gem</i>	212
<i>Phosphatē of lead</i>	284	<i>Sal polychrest</i>	217
<i>Phosphate of lime</i>	109	<i>Salt, common</i>	212
<i>Phosphorated antimony</i>	296	<i>Salt of syl-vius</i>	213
<i>Pbrenite</i>	137	<i>Saltpetre</i>	215
<i>Paytolthus</i>	348	<i>Sand</i>	160
<i>Pipe clay</i>	113	<i>Sand stone</i>	203
<i>Pisolithus, Pisolite</i>	89	<i>Sapphire</i>	142
<i>Pitchstone</i>	132	<i>Sappare</i>	137
<i>Plasma</i>	172	<i>Sardoin</i>	172
<i>Plated spar.</i>	86	<i>Sardonvix</i>	172
<i>Platinum</i>	245	<i>Saitin spar</i>	87
<i>Plumbago</i>	237	<i>Schistospatum</i>	86
<i>Plumbum</i>	281	<i>Scoria</i>	129
<i>Plum-pudding stone</i>	200	<i>Scorus</i>	139
<i>Ponderous spar.</i>	73	<i>Sea froth</i>	63
<i>Porcellanite</i>	156	<i>Sedative salt</i>	211
<i>Porcellane clay</i>	42	<i>Selenitic spar.</i>	104
<i>Porphyrius, Porphryr</i>	186	<i>Serpentinus, Serpentine</i>	65
<i>Potter's clay</i>	113	<i>Serpent stone</i>	335
<i>Pouzzolano</i>	120	<i>Scheelium</i>	308
<i>Prase</i>	105	<i>Shorl</i>	139
<i>Pudding stone</i>	200	<i>Shorlite</i>	145
<i>Pumice stone</i>	129	<i>Seimite</i>	176
<i>Pateolana</i>	120	<i>Silver</i>	249
<i>Pyrites</i>	239, 240	<i>Sinople</i>	275
<i>Pyromachus</i>	152	<i>Slate</i>	123
		<i>Smiris</i>	157
		<i>Snake stone</i>	64
		<i>Soda</i>	210
		<i>Spanish chalk</i>	64
		<i>Spatum, spar</i>	79
		<i>Sphere</i>	312
		<i>Spinell</i>	144
		<i>Stalactites, Stalactite</i>	87, 88
		<i>Stannum</i>	279
		<i>Star stove</i>	345
		<i>Steatite</i>	64
		<i>Stellaris</i>	95
		<i>Stibium</i>	294
		<i>Stillbite</i>	134
		<i>Stone butter</i>	221
		<i>Stone coal</i>	233
		<i>Stone lily</i>	348
		<i>Stream tin</i>	280
		<i>Strontia Strontianite</i>	74
		<i>Succinum</i>	235
		<i>Sullius</i>	94

	Page		Page
<i>Sulphate of ammonia</i> .	217	<i>Tinstone</i> .	280
<i>Sulphate of baryt</i> .	71, 73	<i>Titanium, titanite</i> .	311
<i>Sulphate of cobalt</i> .	223	<i>Toadstone</i> .	127, 320
<i>Sulphate of copper</i> .	224	<i>Topaz</i> .	143
<i>Sulphate of iron</i> .	225, 239	<i>Tophus</i> .	77
<i>Sulphate of lead</i> .	285	<i>Touchstone</i> .	149
<i>Sulphate of lime</i> .	102, 105	<i>Tourmaline</i> .	141
<i>Sulphate of magnesia</i> ,	218	<i>Trapp</i> .	127
<i>Sulphate of potass</i> .	217	<i>Tras</i> .	121
<i>Sulphate of soda</i> .	216	<i>Tremolites, tremolite</i> .	95
<i>Sulphate of strontia</i> .	74	<i>Tripoli</i> .	118
<i>Sulphate of zinc</i> .	223	<i>Tufa</i> .	79
<i>Sulphurum</i> .	238	<i>Tungstenum, Tungsten</i> .	308
<i>Sulphure of lead</i> .	286	<i>Turfa, turf</i> .	228
<i>Sulphuret of antimony</i> .	295	<i>Turilite</i> .	127, 190
<i>Sulphuret of bismuth</i> .	293	<i>Turkey bone</i> .	123
<i>Sulphuret of copper</i> .	266	<i>Vesuvian</i> .	140
<i>Sulphuret of iron</i> .	240, 278	<i>Vitriol of copper</i> .	224
<i>Sulphuret of mercury</i> .	257	<i>Vitriol of iron</i> .	225
<i>Sulphuret of molybdena</i> .	309	<i>Vitriol of lead</i> .	285
<i>Sulphuret of potass</i> .	239	<i>Vitriol of zinc</i> .	223
<i>Sulphuret of silver</i> .	252	<i>Vitriolum, Vitriol</i> .	223
<i>Sulphuret of tin</i> .	279	<i>Umber</i> .	119
<i>Sulphuret of zinc</i> .	291	<i>Volatile alkali</i> .	210
<i>Sulphur pyrites</i> .	239	<i>Volcanic sand</i> .	121
<i>Suessstone</i> .	94	<i>Volcanic shorl</i> .	139
<i>Sydenia, Sydney earth</i> .	75	<i>Uranitic ochre</i> .	310
<i>Sylvanite</i> .	297	<i>Uranium, uranite</i> .	310
T		<i>Wacke, wacken</i> .	127
<i>Talcum, Talc</i> .	63	<i>Whetstone</i> .	123, 207
<i>Tantalum, Tantalite</i> .	314	<i>Whinstone</i> .	127
<i>Tar</i> .	230	<i>White vitriol</i> .	223
<i>Tarras or terras</i> .	121	<i>Wolfram</i> .	308
<i>Tellurium</i> .	297	<i>Wood tin</i> .	280
<i>Thuner stone</i> .	139	<i>Ytrotantalite</i> .	340
<i>Thunder stone</i> .	336	<i>Zeolithus, zeolite</i> .	134
<i>Tigerstone</i> .	208	<i>Zeylanite</i> .	141
<i>Tin</i> .	279	<i>Zincum, zinc</i> .	289
<i>Tinocal</i> .	211	<i>Zinc spar</i> .	290
<i>Tin pyrites</i> .	279	<i>Zircon</i> .	143, 158
<i>Tin spar</i> .	280	<i>Zoolithus</i> .	317

## ERRATA.

Page 243 and 305, for *Magnesium* read *Magnesia*, and through the running title.

Page 248, l. 36. for *pyriticorum* read *pyriticosum*.

# EXPLANATION of TERMS

USED IN THE VARIOUS DEPARTMENTS OF

## NATURAL HISTORY.

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- ABBREVIATED**, shorter than some correspondent part.
- ABDOMEN**, the part of animals containing the viscera. In entomology it is placed immediately behind the thorax, and consists of annular segments : *Insects*, fig. 8. i.
- ABDOMINAL**, the fourth order of fishes, comprehending those having the pectoral fins placed before the ventral. *Fishes*, fig. 5.
- ABRUPT**, a pinnate leaf is termed abrupt, or abruptly pinnate, when it has neither an odd leaf or tendril at the end : *plate 5*, fig. 7. In ichthyology it is applied to the lateral line, when divided into two or more parts not contiguous.
- ACCIPITRES**, the first order of birds, having an angular tooth-like projection on the upper mandible : *Birds*, fig. 3.
- ACEROSE**, linear and permanent : *plate 4*, fig. 7.
- ACICULAR**, sharp-pointed, like a small needle.
- ACINACIFORM**, shaped like a sabre.
- ACULEATE**, furnished with, or ending in prickles.
- ADNATE**, adhering or growing together, adjoining.
- ALGÆ**, the fourth order of the cryptogamous class of plants, consisting of frondose herbs with the seeds imbedded, and not contained in a capsule.
- AMBULATORY**, formed for walking, applied to the feet of birds, where the toes are placed three before and one behind : *Birds*, fig. 6.
- AMENT**, a catkin, or row of chafly scales, ranged along a slender receptacle : *plate 7*, fig. 7.
- AMORPHOUS**, of no determinate shape or figure when broken.
- AMPHIBIA**, the third class of animals, comprising those which from their peculiar structure, have the power of suspending respiration at pleasure, and can live both in water and on land.
- ANAL**, the fin, which in fishes, is placed between the vent and tail, and expands perpendicularly : *Fishes*, fig. 1, c.
- ANASTOMOSING**, inosculating or running into each other, like veins.
- ANCIPITAL**, having two opposite edges or angles.
- ANGIOSPERMIA**, the second order of plants in the class didynamia, having the seeds contained in a vessel.
- ANNULATE**, formed or divided into distinct rings, or marked with differently coloured annulations.
- ANSERES**, the third order of birds having the bill broad at the tip, and covered with a soft skin : *Birds*, fig. 4.
- ANTENNÆ**, the horn-like processes, projecting from the head of insects : *Insects*, fig. 8, 9; c.
- ANTHERA**, the part of the stamen placed on the top of the filament, and containing the pollen or dust of impregnation : *plate 6*, fig. 8, f-i.

- APETALOUS**, flowers destitute of a corol.  
**APHYLLOUS**, destitute of leaves.  
**APODAL**, the first order of fishes, which have no ventral fins : *Fishes*, fig. 3.  
**APTERA**, the seventh order of insects, distinguished by their having no wings : *Insects*, fig. 21.  
**APYROUS**, applied to mineral substances which do not liquefy in the greatest degree of heat.  
**ARILLATE**, furnished with an outer deciduous coat.  
**ASSURGENT**, declining at the base, and rising in a curved manner to an erect position.  
**ATTRACTORIAL**, attracting iron, as the magnet.  
**AURELIA**, the chrysalis, or quiescent stage of transformation in an insect, in which it is inclosed in a hard case or web : *Insects*, f. 13.  
**AURICLED**, having an appendage like a little ear.  
**AURICLES**, the erect crest-like feathers placed over the eyes of some birds, as owls.  
**AWN**, a slender hair-like process : *plate 6*, fig. 7 ; *b*.  
**AXILLARY**, growing from the angles of ramification : *pl. 3*, fig. 8, *e*.  
**BANNER**, the standard or uppermost petal of a papilionaceous corol : *plate 6*, fig. 16 ; *L*.  
**BARB**, a kind of spine armed with teeth pointing backwards.  
**BEARD**, a tuft of strong hairs at the ends of leaves. The tendril-like processes about the mouth of fishes : *Fishes*, fig. 5 ; *c*. The lax pendent simple feathers on the chin or breast of some birds.  
**BELLUE**, the sixth order of animals in the class mammalia, having front teeth both in the upper and lower jaws.  
**BERRY**, a fleshy or pulpy fruit, without valves, containing naked seeds : *plate 8*, fig. 11, 12.  
**BIBULOUS**, gradually absorbing water.  
**BIFARIOUS**, pointing in opposite directions.  
**BIGEMINATE**, applied to a doubly compound leaf, having a forked petiole connecting several leaflets at the top.  
**BIJUGOUS**, having two pairs of leaflets.  
**BILAMELLATE**, divided longitudinally into two laminae.  
**BILOBATE**, divided into two lobes.  
**BILOCULAR**, having two cells.  
**BINATE**, consisting of a single pair : *plate 5*, fig. 1.  
**BIPINNATE**, doubly pinnate or winged : *plate 5*, fig. 16.  
**BIPINNATIFID**, doubly pinnatifid.  
**BIPUPILLATE**, an eye-like spot, having two pupils or dots within it of a different colour.  
**BIRADIATE**, consisting of two rays.  
**BISETOUS**, furnished with two bristle-like appendages.  
**BITERNATE**, doubly or twice three-fold.  
**BIVALVE**, consisting of two valves or divisions.  
**BOTRYOIDAL**, clustered like a branch of grapes.  
**BRACHIATE**, growing horizontally in opposite pairs which alternately cross each other : *plate 3*, fig. 7.

- BRACTE**, a floral leaf, differing from the other leaves, and placed near the corol : *plate 3, fig. 8 ; f.*
- BRANCHIOSTEGOUS**, the fifth order of fishes, or such as have the gills destitute of bony rays.
- BRANCHILET**, a smaller branch, or twig.
- BRUTA**, the second order of animals in the class mammalia, having no front-teeth in either jaw.
- BULLATE**, of a blistered appearance.
- CADUCOUS**, easily and quickly falling off.
- CALCINABLE**, deprived of the cohesion of its parts when exposed to fire.
- CALYCLE**, a smaller or supplemental calyx : *plate 6, fig. 13 ; a.*
- CALYPTRE**, the hood or veil covering the fructification of mosses : *plate 1, fig. 23 ; B. a.*
- CALYX**, the flower-cup, or outer covering of the flower, generally supporting the corol : *plate 6, fig. 8 ; a.*
- CAMPANULATE**, shaped like a bell : *plate 6, fig. 2.*
- CANCELLED**, latticed, or having longitudinal streaks or furrows decussate by transverse ones.
- CAPILLARY**, long and slender like a hair.
- CAPITATE**, terminating in a small head.
- CAPSULE**, the vessel consaining the seeds of flowers : *plate 8, fig. 2, 3, 4.*
- CARINATE**, having a longitudinal prominence, like the keel of a vessel.
- CARUNCLE**, a naked soft fleshy excrescence, often ornaumenting some parts of the head of birds.
- CASTRATE**, applied to the stamina when they are without anthers.
- CATAPHRACTED**, covered with a hard callous skin, or with cartilaginous scales closely united.
- CATKIN**, an ament, or row of chaffy scales, ranged along a slender receptacle : *plate 7, fig. 7.*
- CAUDEX**, the trunk or stem of a tree.
- CAULESCENT**, furnished with a stem, distinct from that which supports the flower.
- CAULINE**, attached immediately to the stem.
- CERE**, the membrane covering the base of the bill in birds, generally coloured : *Birds, fig. 3 ; b.*
- CETE**, the sixth order of animals in the class mammalia, containing those which inhabit the sea, and are without feet.
- CHAFFY**, covered with chaff-like scales : A chaffy receptacle is that in which the fterets have chaffy scales interposed between them.
- CHONDROPTERIGIOUS**, the sixth order of fishes, including such as have a cartilaginous sceleton.
- CILIATE**, edged with parallel hairs, bristles or appendages.
- CINEROUS**, grey, the colour of wood ashes.
- CIRCINAL**, spirally rolled inwards and downwards, as in the foliation of ferns.
- CIRCUMCISED**, applied to the capsule when it opens horizzontall round, like a snuff box : *plate 8, fig. 2.*
- CIRROSE**, furnished with a tendril-like appendage.

- CIRRUS**, a tendril-like appendage : *Fishes*, fig. 5 ; *c*.
- CLASS**, the primary and chief division in a system or arrangement.
- CLAVATE**, club-shaped, thicker towards the top.
- CLAW**, the lower part of a petal, by which it is attached to the receptacle : *plate 6*, fig. 9 ; *a*.
- CLYPEATE**, shield-like, or covered with a shield.
- COADUNATE**, two or more joined together.
- COATED**, furnished with an outer deciduous covering ; or composed of concentric layers, as the bulb of an onion : *plate 2*, fig. 7.
- COCHLEATE**, twisted like a screw, or the shell of a snail.
- COLEOPTERA**, the first order of insects, having the outer pair of wings of a crustaceous substance : *Insects*, fig. 15.
- COLLAR**, a coloured ring round the neck of birds.
- COMOSE**, ending in a tuft or kind of brush.
- CONDUPLICATE**, doubled together : *plate 8*, fig. 17.
- CONJUGATE**, consisting of a single pair.
- CONNATE**, joined together so as to have the appearance of only one.
- CONTORTED**, twisted, or incumbent on each other in an oblique direction.
- CONVOLUTE**, rolled together like a piece of paper between the thumb and finger : *plate 8*, fig. 14.
- CORDATE**, heart-shaped : *plate 4*, fig. 10.
- CORIACEOUS**, of a leather-like consistence.
- COROL**, the blossom of a flower, generally inclosed within the calyx : *plate 6*, fig. 3 ; *b*.
- CORYMB**, a kind of inflorescence, when the partial flower stalks rise of unequal lengths along the common flower-stalk to the same elevation at top, forming a nearly flat or even surface : *pl. 7*, f. 2.
- CRENATE**, scalloped or notched at the margin : *plate 4*, fig. 33.
- CRESTED**, having a tuft or crest-like appendage.
- CRUCIFORM**, placed in the form of a cross : *plate 6*, fig. 9.
- CRYPTOGAMIA**, the twenty-fourth class of vegetables including those whose fructification is too minute to be discovered by the naked eye : *plate 1*, fig. 24.
- CULM**, the stem of corn and grasses : *plate 3*, fig. 1.
- CULTRATE**, shaped like a pruning knife.
- CUNEIFORM**, shaped like a wedge : *plate 4*, fig. 45.
- CURSORY**, formed for running ; applied to the feet of birds which have all the toes placed forwards : *Birds*, fig. 12.
- CUSPIDATE**, ending in a sharp point, like the tip of a spear.
- CYATHIFORM**, shaped like a drinking glass.
- CYME**, a kind of inflorescence, where the primary flower-stalks arise from the same point, but having the partial-ones irregular, all of the same elevation and forming a nearly flat and even surface : *plate 7*, fig. 11.
- DECAGYNIA**, having ten styles.
- DECANDRIA**, the tenth class of vegetables, containing the hermaphrodite ones with ten distinct stamina : *plate 1*, fig. 10.
- DECOMPOUND**, having the leaf-stalk more than once divided : *plate 5*, fig. 18, 19.

- DECREPITANT**, crackling when burnt.
- DECURRENT**, closely attached to and running down the stem or other part.
- DECURSLVELY PINNATE**, having the leaflets running down the petiole.
- DECUSSATE**, growing in pairs which cross each other at right angles.
- DEFLECTED**, bending down archwise.
- DELTOID**, triangularly spear-shaped : *plate 4*, fig. 58.
- DEMERSED**, growing under water.
- DENTICULATE**, having small teeth or notches : *plate 4*, fig. 30.
- DETONANT**, emitting an explosion when burnt.
- DIADELPHIA**, the seventeenth class of vegetables, comprehending those hermaphrodite flowers which have the stamina united in two sets : *plate 1*, fig. 17.
- DIANDRIA**, the second class of vegetables, including the hermaphrodite ones with two stamina : *plate 1*, fig. 2.
- DICHOTOMOUS**, divided in a forked manner.
- DIDYNAMIA**, the fourteenth class of plants, including the hermaphrodite ones with two pair of stamina, one pair of which is longer : *plate 1*, fig. 14.
- DIGITATE**, divided in a finger-like manner, and connected to the stalk at the base : *plate 5*, fig. 4.
- DIGYNIA**, having two styles.
- DIOECIA**, the twenty-second class of vegetables, comprehending those which have the male and female flowers on distinct plants : *plate 1*, fig. 22.
- DIOPTERATE**, applied to the eye-like spot on the wings of some insects where the pupil is divided by a transverse line.
- DIPTERA**, the sixth class of insects, comprising those which have two membranous wings, with a clavate poiser under each : *Ins.* fig. 20.
- DISSILIANT**, bursting open elastically.
- DISTICH**, pointing two ways only.
- DIVARICATE**, spreading out widely.
- DIVERGENT**, forming a right angle with the stem.
- DODECANDRIA**, the eleventh class of plants, comprising the hermaphrodite ones with 12-19 stamina. : *plate 1*, fig. 11.
- DODECAGYNIA**, having twelve pistils.
- DOLABRIFORM**, shaped like a hatchet : *plate 4*, fig. 57.
- DORSAL**, placed on the back.
- DRUPE**, a pulpy fruit, inclosing a nut or stone with a kernel : *pl. 8*, fig. 9.
- ECHINATE**, covered with prickles like a hedge hog.
- ELECTRIC**, attracting straws or light particles, when rubbed or heated.
- EMARGINATE**, with a notch at the end : *plate 4*, fig. 45.
- ENNEANDRIA**, the ninth class of plants, including the hermaphrodite ones with nine stamina : *plate 1*, fig. 9.
- ENSIFORM**, two-edged and tapering towards the point, like a sword.
- EPUPILLATE**, applied to the eye-like spot on the wings of some insects, surrounded with a coloured ring, but without the pupil-like dot in the centre. *Blind. Insects*, fig. 17.

**EQUITANT**, in foliation, where the sides of leaves converge in parallel lines, so that the inner-leaves are enfolded by the outer ones : *plate 8, fig. 26, 27.*

**ERODED**, having the edges irregularly jagged as if gnawed or eaten by insects.

**EXTRAFOLIACEOUS**, growing on the outside of leaves or below them

**FALCATE**, shaped like a sickle.

**FASCICLED**, clustered together as in a bundle.

**FASTIGIATE**, flat and even at top : *plate 7, fig. 2.*

**FATISCENT**, spontaneously mouldering and falling to pieces in the air.

**FEELERS**, organs fixed to the mouth of insects, generally less than the antennæ, and often jointed : *Insects, fig. 8, 9; b.*

**FENESTRATE**, applied to the naked hyaline transparent spots on the wings of butterflies.

**FESTUCINE** of a shivery or splintery fracture.

**FETTERED**, applied to the feet of animals when they are stretched backwards, and appear unfit for the purpose of walking, or when they are concealed within the integuments of the abdomen, as in some birds.

**FILAMENT**, a slender thread-like substance, that part of the stamen which supports the anthera, and connects it with the flower : *plate 6, fig. 8; c.*

**FILATE**, applied to the antennæ of insects, when they want the round knob at the tip.

**FILIFORM**, thread-shaped, slender and of equal thickness.

**FILOSE**, ending in a thread-like process.

**FIN**, the organ in fishes, by which they perform their several movements in the water : *Fishes, fig. 1; a-e.*

**FINGERS**, cartilaginous slender appendages, sometimes observable in fishes, between the pectoral and ventral fins : *Fishes, fig. 4; c.*

**FLORET**, the separate and distinct flower of an aggregate or compound one : *plate 6, fig. 18, 19, 20.*

**FLOSCULAR**, the tubular floret of a compound flower when destitute of ray : *plate 6, fig. 18, 20.*

**FOLIACEOUS**, leafy, or leaf-like. Herbaceous, with leaf-like parts.

**FOLLICLE**, a single-valved seed-vessel, opening longitudinally on one side : *plate 8, fig. 7.*

**FOVEOLATE**, honeycombed, covered superficially with cubic hollows.

**FOVILLA**, the fine imperceptible substance discharged by the pollen of the anthers.

**FRIABLE**, easily crumbled or reduced to powder.

**FROND**, the leafy part of ferns and lichens supporting the fructification

**FRONT**, the anterior part of the crown of the head in animals.

**FRONTLET**, the margin of the head behind the bill of birds, generally clothed with rigid bristles : *Birds, fig. 2, d.*

**FRUTESCENCE**, the period of vegetables when they scatter their perfect seeds and fruits.

**FRUSTRANEA**, the third order of the class syngenesia, containing those compound plants which have fertile florets in the disk, and imperfect and barren ones in the ray.



**FRUTESCENT**, becoming at length shrubby.

**FUMANT**, emitting smoke when burnt.

**FUNGI**, the fifth order of vegetables in the class cryptogamia, including such as are destitute of herbage, and produce the fructification a more or less spongy body : *plate 1, fig. 24; D.*

**FUSIFORM**, spindle-shaped, gradually tapering more or less to both ends : *plate 2, fig. 2.*

**GALLINÆ**, the fifth order of birds, containing all the poultry kind, and distinguished by a convex bill with the upper mandible arched.

**GAPE**, the opening between the mandibles of birds, and between the two lips of an irregular corol.

**GARTERS**, coloured rings in some birds, round the naked part of the thighs just above the knees.

**GENICULATE**, bending abruptly in an obtuse angle, like the knee when a little bent.

**GENUS**, a distinct and entire family of plants, giving its surname to all the species or individuals of which it is composed ; and comprehending all those vegetables of the same class and order, which agree in their parts of fructification.

**GERM**, the ovary or seed-bed, attached to the base of the pistil, and containing the rudiments of the seeds : *plate 6, fig. 8; b.*

**GILL-COVER**, the bony or cartilaginous substance placed on the membrane which covers the gills : *Fishes, fig. 1, g.*

**GILLS**, the organs of respiration in fishes : The laminae on the under-side of fungi.

**GLABROUS**, of a smooth surface, opposed to hairy, downy, villous, &c.

**GLIRES**, the fourth order of animals in the class mammalia, including those which have two cutting-teeth in each jaw, and no tusks.

**GLUME**, the valves or chaffy husks of corn and grasses, enveloping the seeds : *plate 6, fig. 7; a.*

**GRALLÆ**, the fourth order of birds or such as have a roundish bill and fleshy tongue, and the legs naked above the knees.

**GRESSORIAL**, applied to the feet of birds which have three toes forward, two of which are connected, and one behind.

**GYMNOSPERMIA**, the first order of plants in the class didynamia, comprising such as have the seeds naked.

**GYNANDRIA**, the twentieth class of plants, comprising those hermaphrodite vegetables which have the stamina growing on the style, or bearing both the stamina and styles on a long receptacle : *plate 1, fig. 20.*

**HASTATE**, halbert-shaped, resembling the head of a halbert : *pl. 4, fig. 15.*

**HELMET**, the upper lip of a ringent corol : *plate 6, fig. 12; a.*

**HEMIPTERA**, the second order of insects, or such as have 4 wings, the upper pair of which are semicrustaceous and incumbent on each other : *Insects, fig. 16.*

**HEPTANDIRA**, the seventh class of plants, including those hermaphrodite ones which have 7 stamina : *plate 1, fig. 7.*

**HERMAPHRODITE**, having both stamen and pistil in the same flower : *plate 1, fig. 1.*

**HEXAGYNIA**, having 6 styles.

**HEXANDRIA**, the sixth class of plants, containing such hermaphrodite ones as have 6 stamina all of the same length : *plate 1, fig. 6.*

**HIRSUTE**, rough with hairs.

**HISPID**, beset with rather stiff bristles.

**HOARY**, clothed with a white pubescence.

**HUMESCENT**, gradually and slowly imbibing moisture.

**HYALINE**, transparent, like glass.

**HYMENOPTERA**, the fifth order of insects, comprising such as have wings, all of them membranous, and are armed with a sting : *Insects, fig. 19.*

**ICOSANDRIA**, the twelfth class of plants, including those hermaphrodite ones which have twenty or more stamina, fixed to the calyx or petals and not to the receptacle : *plate 1, fig. 12.*

**IMBRICATE**, placed over each other at the edges, like the tiles of a house.

**INCISORS**, the front or cutting teeth of animals.

**INCONSPICUOUS**, in mineralogy applied to substances which are devoid of lustre or metallic splendor.

**INCURVED**, bent or curved inwards.

**INDURATING**, in mineralogy, becoming harder by the action of fire, as clays.

**INFLAMMABLE**, emitting flames when burnt.

**INFLECTED**, bent inwards.

**INFLORESCENCE**, the peculiar mode of flowering.

**INFRACTED**, abruptly bent inwards, as if broken.

**INFUSORIA**, the fifth order of worms, comprehending those minute animalcules, destitute of feelers, generally not visible to the naked eye, and which are mostly found in various infusions.

**INQUINANT**, soiling the fingers when rubbed between them. Leaving coloured marks when rubbed against other substances.

**INTERNODE**, the space between one knot or joint and another.

**INTERRUPTEDLY-PINNATE**, having smaller leaflets or segments between each pair of larger ones : *plate 5, fig. 9.*

**INTERSCAPULAR**, placed between the shoulders, or joints of insertion of the wings : *Birds, fig. 1 ; t.*

**INTESTINA**, the first class of worms, consisting of simple naked animals, without limbs.

**INTORSION**, the turning or twisting in any particular direction.

**INTRACTABLE**, not attracted by the magnet

**INTUMESCENT**, swelling or frothing when exposed to the action of fire.

**INVOLUCEL**, a small or partial involucre : *plate 7, fig. 5 ; c.*

**INVOLUCRE**, a species of calyx placed beneath and remote from the flower, as in umbelliferous plants : *plate 7, fig. 5 ; b.*

**INVOLUTE**, rolled inwards on both sides towards the upper surface : *plate 8, fig. 15.*

**ISTHIMUS**, a transverse partition.

**JUGULAR**, the second order of bony fishes, or such as have the ventral fins placed before the pectoral : *Fishes*, fig. 1.

**KEEL**, the lower petal of a papilionaceous flower, and which incloses the stamina and pistil : *plate 6*, fig. 16 ; *b*.

**KNEE-JOINTED**, bending abruptly in an obtuse angle, like the knee when a little bent.

**LABIATE**, applied to an irregular corol with two lips : *plate 6*, fig. 14.

**LACINIATE**, jagged or cut into irregular segments.

**LACTESCENT**, discharging a white or coloured fluid, when cut or bruised.

**LACUNOSE**, having the surface covered with small pits.

**LAMELLATE**, divided into distinct plates or foliations.

**LANCEOLATE**, oblong and gradually tapering to each end, like the head of a lance : *plate 4*, fig. 6.

**LARVA**, the grub or caterpillar state of an insect : *Insects*, fig. 14.

**LATERAL-LINE**, the line which runs from the head to the tail in the middle of the sides of most fishes. : *Fishes*, fig. 1 ; *h*.

**LATTICED**, having longitudinal lines or furrows, decussate by transverse-ones.

**LEGUME**, a membranous or coriaceous pod or seed vessel opening longitudinally, generally oblong, having the seeds fixed to one valve only : *plate 8*, fig. 9.

**LENTICULAR**, resembling small lentils.

**LEPIDOPTERA**, the third class of insects, including those which have 4 membranous wings clothed with fine scales : *Insects*, fig. 17.

**LIGULE**, the thin membrane which terminates the sheath on the stems of corn and grasses.

**LIGULATE**, strap-shaped, applied to the flat corollet of a compound flower : *plate 6*, fig. 19.

**LINEAR**, narrow and nearly of an uniform breadth.

**LINEATE**, marked with lines.

**LITHOPHYTES**, that division of zoophytes which have a hard calcareous stem

**LOMENT**, an oblong seed-vessel, not opening longitudinally like a legume, but separated by transverse partitions, and containing a single seed in each joint.

**LORE**, a naked line between the base of the bill and the eye in birds : *Birds*, fig. 2 ; *i*.

**LORICATE**, covered with a long kind of mail.

**LUBRICOUS**, covered with a slippery mucus.

**LUNULATE**, **LUNATE**, shaped like a crescent : *plate 6*, fig. 11.

**LUNULE**, a crescent-like mark or spot.

**LYRATE**, cut into transverse segments which are gradually smaller and more remote downwards, like an ancient lyre : *plate 5*, f. 14.

**MAILED**, covered with a long kind of mail.

- MAMMALIA**, the first class of animals, including such as suckle their young by means of lactiferous teats.
- MANDIBLES**, the 2 pieces composing the bill of birds: *Birds*, f. 2, a. b.
- MERGIFORM**, clustered like a sheaf of corn.
- MOLLUSCA**, the second order of worms, comprising those simple naked animals which are furnished with limbs.
- MONADELPHIA**, the sixteenth class of plants, comprising those hermaphrodite vegetables with one set of united stamina: *plate* 1, f. 16.
- MONANDRIA**, the first class of plants, containing those hermaphrodite ones which have only one stamen: *plate* 1, fig. 1.
- MONILIFORM**, beaded like a necklace: *plate* 3, fig. 9; g.
- MONŒCIA**, the twenty-first class of plants, including such as have both stamen and pistil on the same plant, but in distinct flowers; *plate* 1, fig. 21.
- MONOGYNIA**, having one style only: *plate* 1, fig. 1.
- MONASTYCHOUS**, bearing a single spike.
- MUCRONATE**, ending in a sharp rigid point.
- MUTE**, in mineralogy applied to metals which do not ring when struck with other hard substances.
- MURICATE**, clothed with sharp rigid points.
- MUSCI**, mosses, the second order of the class cryptogamia, containing those leafy vegetables having a capsule furnished with a deciduous veil and a lid: *plate* 1, fig. 24; B.
- NATATORY**, legs or appendages formed for swimming.
- NECESSARIA**, an order of vegetables of the class syngenesia, where the florets of the disk are barren for want of a stigma, but the female florets of the ray produce perfect seeds.
- NECTARY**, that part of the flower which usually contains a sweet honey-like fluid: *plate* 6, fig. 23; a.
- NEUROPTERA**, the fourth order of insects, comprehending such as have 4 membranous finely reticulate wings, and have no sting: *Insects*, fig. 18.
- NICTITANT MEMBRANE**, a thin membrane which covers the eyes of birds and fishes sheltering them from too much light and external injuries, and through which they can see pretty distinctly.
- OB**, in composition is used for obversely or inverted; as obconic, inversely conic; obcordate, inversely heart-shaped, &c.
- OBVOLUTE**, applied to the foliation of leaves: when the margins alternately embrace the straight margin of the opposite leaf: *pl.* 8, f. 20.
- OCCELLATE**, applied to eye-like spots which are surrounded with a ring of a different colour called the iris, and often inclosing one or more lesser spots called the pupil: *Insects*, fig. 17.
- OCTANDRIA**, the eighth class of vegetables, including those hermaphrodite plants which have 8 stamina: *plate* 1, fig. 8.
- ORBITS**, the region round the eyes: *Birds*, fig 3; c.
- ORDER**, the subdivision of a class, or second branch of systematical arrangement.
- OVATE**, shaped like the longitudinal section of an egg.

- PALMATE**, webbed, like the feet of some water birds: *Birds*, fig. 8.  
 Deeply divided into lobes like the fingers on the hand: *plate 2*, fig. 5; *plate 4*, fig. 22.
- PANDERÆFORM**, shaped something like a fiddle or ancient guittar: *plate 4*, fig. 38.
- PANICLE**, a kind of inflorescence where the flowers are scattered on stalks variously or irregularly divided: *plate 7*, fig. 4.
- PAPILIONACEOUS**, applied to an irregular corol, shaped something like a butterfly on the wing: *plate 6*, fig. 16.
- PAPILLOUS**, having the surface covered with fleshy dots or pimples: *plate 4*, fig. 54.
- PAPULOUS**, pimple or blistered.
- PARABOLIC**, having the longitudinal diameter exceeding the transverse one, and narrowing from the base into a half ovate.
- PASSERES**, the sixth order of birds, or such as have a conic sharp-pointed bill and slender divided toes.
- PATELLÆ**, soft orbicular raised moveable bodies at the base of the thighs in some insects, as the ichneumon genus.
- PECORA**, the fifth order of the class mammalia, comprehending those which have no front-teeth in the upper jaw, and whose feet are hoofed and cloven.
- PECTINATE**, cut into regular straight segments, like the teeth of a comb.
- PEDATE**, deeply cut into segments connected with the petiole on the inner-side only, like a bird's foot: *plate 5*, fig. 5.
- PEDICEL**, a partial or lesser flower-stalk: *plate 7*, fig. 2; *a*.
- PEDUNCLE**, the stem supporting the flowers or fruit.
- PELTATE**, target-shaped. Having the stalk inserted in the disk of the leaf, and not in the edge: *plate 3*, fig. 11; *b*.
- PENNACEOUS**, feathered like the web of a quill.
- PENTAGYNIA**, having 5 styles.
- PENTANDRIA**, the fifth class of vegetables, comprising such hermaphrodite plants as have 5 stamina: *plate 1*, fig. 5.
- PERFOLIATE**, surrounding the stalk on every side, as if it passed through its centre.
- PERIANTH**, the calyx of a flower when close to the other parts of fructification: *plate 6*, fig. 2. *a*.
- PERICARP**, the vessel containing the seed: *plate 8*, fig. 7.
- PERISTOME**, the fringe or teeth surrounding the mouth of the capsule in mosses.
- PERSONATE**, an irregular corol having 2 lips which are closed: *plate 6*, fig. 14.
- PETAL**, one of the leaves of a corol when it has more than one: *plate 6*, fig. 9.
- PETALOID**, resembling a petal.
- PETIOLE**, the stalk supporting a leaf: *plate 5*, fig. 3.
- PETIOLULE**, a partial petiole connecting the leaflet of a compound leaf with the main petiole.
- PHOSPHORESCENT**, emitting light in the dark.

- PINNATE**, divided into transverse segments down to stem or midrib : *plate 5, fig. 6, 7, 8.*
- PINNATIFID**, divided into transverse segments, but not extending to the midrib.
- PISTIL**, the female part of fructification supported by the germ, generally in the centre of the flower : *plate 6, fig. 19; 6.*
- POISERS**, two pedicelled heads placed one under each wing of such insects as have only two.
- POLLEN**, the prolific meal-like powder contained in the antheræ of flowers : *plate 6, fig. 8, 9.*
- POLYADELPHIA**, the eighteenth class of vegetables, comprising such hermaphrodite flowers as have the stamina united into three or more sets : *plate 1, fig. 18.*
- POLYANDRIA**, the thirteenth class of vegetables, consisting of such hermaphrodite flowers as have 20 or more stamina placed on the receptacle : *plate 1, fig. 13.*
- POLYGAMIA**, the twenty-third class of plants, comprehending such as have hermaphrodite flowers, together with male or female, or both, on the same plant : *plate 1, fig. 23.*
- POLYGYNIA**, having more than 12 pistils.
- POLYSTACHOUS**, bearing many spikes.
- POME**, a pulpy fruit, having the seeds lodged in a core : *plate 8, fig. 8.*
- PORCATE**, marked with raised longitudinal lines.
- POUCH**, a silicle or 2-valved seed vessel, having the seeds fixed along both sutures, and whose transverse diameter is nearly equal to its longitudinal : *plate 8, fig. 1.*
- PRÆMORSE**, ending abruptly, as if bitten off.
- PREHENSILE**, applied to the tails of animals when they have the power of coiling them round other substances, and suspending their bodies by them.
- PRIMATES**, the first order of animals in the class mammalia, containing such as have 4 parallel cutting-teeth in each jaw, and a solitary tusk on each side in each jaw.
- PRISMATIC**, of the same thickness from top to bottom, and having several flat sides.
- PROBOSCIS**, a moveable elongated snout.
- PROCUMBENT**, prostrate or trailing on the ground, but not taking root.
- PROLIFEROUS**, having branches only from the centre of the top. With smaller flowers growing from the principal one. Applied to to an umbel it means more than twice divided.
- PRUINOUS**, covered with a frosty kind of mealliness.
- PUBESCENT**, covered with a soft kind of hair or down.
- PULVEREOUS**, reducible to dust when dry.
- PUPA**, the chrysalis or quiescent state of an insect : *Insects, fig. 13.*
- PUPIL**, applied to the inner coloured spot in the wing-like spots of some insects : *Insects, fig. 17.*
- RACEME**, a cluster, in which the flowers or fruit are placed along a common foot-stalk, having short lateral branches : *plate 7, fig. 3.*

- RACHIS**, the midrib or filiform receptacle connecting florets into a spike.
- RADIATE**, furnished with rays, applied to the irregular florets of the circumference in a compound flower : *plate 7, fig. 12.*
- RADICATE**, proceeding directly from the root.
- RAMEOUS**, growing on or proceeding directly from a branch.
- RECEPTACLE**, the bed or base by which the other parts of fructification are connected : *plate 6, fig. 17 ; a.*
- REFRACTED**, abruptly bent, as if broken.
- RENIFORM**, kidney-shaped : *plate 4, fig. 11.*
- REPAND**, with a serpentine margin : *plate 4, fig. 29.*
- RESUPINATE**, reversed. When the lower part is turned upwards, and the upper downwards.
- RETICULATE**, marked like a piece of net-work.
- REFRACTORIAL**, attracted by the magnet.
- RETROFLECTED**, bending in different directions.
- RETROFRACTED**, hanging down as if broken.
- REFUSE**, ending in an obtuse sinus : *plate 4, fig. 46.*
- REVOLUTE**, rolled backwards : *plate 8, fig. 15.*
- RINGENT**, applied to an irregular corol with 2 lips, which are gaping open : *plate 6, fig. 12.*
- ROTATE**, applied to a flat 1-leaved corol without any tube : *pl. 6, f. 16.*
- RUNCINATE**, pinnatifid in such a manner, that the lobes which are convex forwards are transverse or concave behind : *plate 1, fig. 27.*
- SAGITTATE**, shaped like the head of an arrow : *plate 4, fig. 13.*
- SALTATORY**, applied to the legs of insects, and means, having the thighs thicker and formed for leaping.
- SALVER-SHAPED**, applied to a 1-leaved flat corol, rising from a tube, *plate 6, fig. 4.*
- SAMARA**, a fruit inclosed between two membranes, like the mast of the elm.
- SAPID**, stimulating the organs of taste.
- SARMENT**, a shoot taking root at the joints.
- SARMENTOUS**, nearly naked, or having the leaves only in tufts at the joints.
- SCALY**, applied to a root it means composed of scales lying over each other : *plate 2, fig. 8.*
- SCANSORIAL**, formed for climbing : Applied to the feet of birds which have two toes before and two behind, all divided to the base : *Birds, fig. 7.*
- SCAPE**, a stem bearing the fructification without leaves, as the stalk of a hyacinth.
- SCAPULARS**, the feathers between the wings of birds : *Birds, f. 1, d.*
- SACRIOUS**, dry and rigid, as if dead.
- SCINTILLANT**, emitting sparks of fire when burnt.
- SCITAMINEOUS**, of a spicy taste and odour.
- SCROBICULATE**, pitted, having the surface covered with hollows.
- SCUTEL**, the portion on the back of an insect which is situated between the thorax and abdomen : *Insects, fig. 8 ; f.*

**SEGREGATA**, an order of the syngenesious class of plants, where several florets are inclosed in a common calyx, and each furnished with its proper calyx.

**SERRATE**, cut or notched like a saw : *plate 4, fig. 31.*

**SESQUIALTERAL**, having a small abortive floret accompanying the large one. In entomology it means occupying a third part of the wing, or including a smaller band or spot within a larger one.

**SESQUITERTIAL**, occupying the fourth part.

**SESSILE**, connected immediately with the part from which it originates, without the intervention of support.

**SETACEOUS**, bristle-shaped.

**SETARIOUS**, applied to the antennæ of insects, it means, terminating in a simple naked bristle.

**SHIELD**, the saucer-like fructification of lichens : The coloured spot on the wings of some birds of the duck kind : The scutellum of insects.

**SILICLE**, a 2-valved seed-vessel, nearly as wide as long, with the seeds fixed to both sutures, but without partition.

**SILIQUE**, a pod or 2-valved seed-vessel, with the seeds fixed to both sutures, having a membranous partition running down its whole length.

**SINUATE**, cut into deep sinuses : *plate 4, fig. 25.*

**SPADIX**, the receptacle of such flowers as are produced from a spathe, or sheath : *plate 6, fig. 6, b.*

**SPATHE**, the calyx of a spadix, opening longitudinally like a sheath : *plate 6, fig. 6, a.*

**SPATULATE**, rounded and broad at the top and becoming narrower at the base, like a spatula or battledore : *plate 6, fig. 39.*

**SPECIES**, the division of a family or genus, containing such as agree with it in generic character.

**SPECULAR**, exhibiting objects distinctly through it, as a piece of glass or talc.

**SPHACELATE**, dead and as if burnt at the edges.

**SPIKE**, that kind of inflorescence where the flowers are sessile or ranged alternately along a common receptacle or stalk : *plate 7, f. 1.*

**SPIKELET**, a partial or lesser spike.

**SPINESCENT**, becoming hard and thorn-like.

**SPIRACLES**, the apertures in animals through which they breathe.

**SPIRE**, the whorls of single-valved shells.

**SPUMESCENT**, frothing up when burnt.

**SPUR**, the sharp appendage on the heel of some birds : *Birds, fig. 6.*  
The horn-like nectary of some flowers.

**SPURIOUS WINGS**, small secondary wings at the end of the joint of the wings in birds, generally consisting of 3 or 5 short feathers : *Birds, fig. 1, a.*

**SQUARROSE**, consisting of scales spreading every way, or divided into pieces standing upright and not parallel with the plane.

**STAMEN**, the male organ of fructification in plants : *plate 6, fig. 10.*

**STELLATE**, radiating like the spokes of a wheel.

**STEMMATA**, the 2 or 3 simple eyes placed on the crown of the head of some insects.



- STIGMA**, the uppermost point of the style: *plate 6, fig. 11, c.*
- STIPITATE**, elevated on a kind of stem.
- STIPULE**, a small scale at the base of the rising petiole.
- STOLE**, a sucker or scion from the root of plants.
- STRAP-SHAPED**, nearly of the same width all along.
- STRIATE**, marked with very fine lines.
- STRIGOSE**, clothed with stiff lanceolate bristles.
- STROBILE**, a kind of fructification consisting of scales incumbent on each other as a cone.
- STYLE**, the middle of the pistil, connecting the stigma with the germ: *plate 6, fig. 11, b.*
- SUB**, in composition it means almost or approaching to; as subimbricate, somewhat imbricate.
- SUBULATE**, awl-shaped. Gradually tapering to a point: *pl. 1, fig. 8.*
- SUBFRUTICOSE**, somewhat but not quite shrubby.
- SUPERFLUA**, the second order of plants in the class syngenesia, having the florets of the disk hermaphrodite and fertile, and the florets of the ray female only, but fertile.
- SYNGENESIA**, the nineteenth class of plants, comprising those compound flowers which have 5 stamina united into a cylinder: *plate 1, fig. 19.*
- TENDRIL**, a small flexible appendage: *plate 3, fig. 12, b.*
- TENTACULA**, the feelers of worms.
- TERGEMINATE**, thrice double.
- TERN**, three-fold, in threes: *plate 5, fig. 2.*
- TERNATE**, having 3 leaflets on one petiole: *plate 5, fig. 3.*
- TESSELATE**, chequered like a chess board.
- TESSERA**, a cubical figure, having 4 principal sides distinct from the horizontal planes above and below, or other angles, like a die.
- TESTACEA**, the third order of worms, including those which are covered with a shell.
- TETRADACTYLOUS**, having 4 toes or claws.
- TETRADYNAMIA**, the 15th class of plants, comprising such as have hermaphrodite flowers with 6 stamina, 4 of which are longer: *plate 1, fig. 15.*
- TETRAGYNIA**, having 4 styles.
- TETRANDIA**, the fourth class of plants, including those hermaphrodite ones which have 4 stamina, all of the same length: *pl. 1, f. 4.*
- THORACIC**, the third order of fishes, comprising those bony ones which have the ventral fins placed directly under the pectoral ones: *Fishes, fig. 4.*
- THORAX**, the anterior part of the back of insects, placed between the head and the scutellum or abdomen. *Insects, fig. 8, c.*
- THYRSE**, a panicle condensed into an ovate form.
- TONGUE-SHAPED**, linear and fleshy, obtuse, and generally convex underneath.
- TOROSE**, swelling into knobs or protuberances.
- TORULOUS**, a diminutive of the former.

- TRIANDRIA**, the third class of vegetables, comprehending those hermaphrodite plants which have 3 stamina : *plate 1, fig. 3.*
- TRICHOTOMOUS**, cloven into three, 3-forked.
- TRICUSPIDATE**, ending in three points.
- TRIDACTYLOUS**, having three toes or claws.
- TRIGYNIA**, having three styles.
- TRICECIA**, the third order of plants in the class polygamia, containing such as have hermaphrodite, male, and female flowers, each on a distinct plant.
- TROCHANTERS**, oblong moveable appendages placed at the base of of the thighs, near the thorax, in some insects ; as the carabus kind.
- TRUNCATE**, cut abruptly off at the end.
- TUNICATE**, composed of numerous concentric coats, as the bulb of an onion : *plate 2, fig. 7.*
- TURBINATE**, shaped like a top, or pear.
- VENTRICOSE**, inflated, swelling in the middle.
- VESICULAR**, having small vessels on the surface, or composed of small distinct vessels.
- VILLOUS**, clothed with soft hair.
- VIRGATE**, wand-like, or rod-like.
- VITRESCENT**, fusible into glass by the action of fire.
- UMBEL**, a kind of inflorescence where the fructification is supported on several slender stalks all from the same centre : *plate 7, fig. 5.*
- UMBELLATE**, a partial umbel : *plate 7, fig. 5, a.*
- UMBILICATE**, having a depression in the centre like a navel.
- UMBONATE**, bossed, having a raised knob in the centre.
- UNDULATE**, having a waved surface.
- UNGULATE**, shaped like a horse's hoof.
- VOLVE**, the curtain or ruffle of a fungus : *plate 1, fig. 24, B. d.*
- URCEOLATE**, swelling in the middle like a pitcher.
- WATTLES**, the fleshy appendages at the sides of the lower mandible in some birds.
- WHORL**, the position of a part all round that to which it is attached : *plate 3, f. 9, b.* The spire or mass of circles at the top of shells.
- WING-COVERTS**, the feathers covering the wings of birds : *Birds, fig. 1, b. c.*
- WING-SPOT**, the coloured shining spot on the anterior margins of the wings of some birds.

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#### ERRATA in the LIFE.

p. 23, l. 18, for immedi read immediate.

p. 31, l. 18, for struct read struck,

p. 27, l. 1, for pofessed read possessed.

p. 41, l. 15, for berevi read brevi.

p. 41, l. 20, for genuine read generic.







